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ABSTRACT

The California Employment Training Panel (ETP), which was designed as a performance-driven training program, pays agencies for training provided only if the trainee is placed and retained in a related job for 90 days. The labor market experience of ETP trainees was tracked from 1989-90, 1990-91, and 1991-92 to measure the impact of ETP training on individual trainees through 1993 and to estimate ETP's impact on California's economy. In the most recent year of the study, the labor market experiences of ETP participants were compared to those of a group of 130,000 randomly selected California workers. Among the study's major conclusions were the following: (1) increased employment stability is a major benefit of ETP training; (2) ETP trainees who complete the program have larger earnings increases than either program dropouts or workers in the control group; (3) the training provided to ETP's 1991-92 trainees resulted in a total economic gain of more than $202 million while costing California only approximately $35 million; and (4) during the 3 years studied, ETP seemed to shift its emphasis from nonbasic service industries to greater investment in basic industries. Contains 50 figures and 8 tables. Appended are tables detailing training characteristics and multipliers used in the analysis.) (MN)

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CALIFORNIA STATE UNIVERSITY
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Accounting for Training:
An Analysis of the Outcomes of California Employment Training Panel Programs

By:

Richard W. Moore
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G. Michael Phillips

July 5, 1995

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Executive Summary

Accounting for training outcomes is an important task which will become even more important in the near future. Federal and state job training, employment and vocational education policies create a patchwork of programs, many aimed at particular populations ranging from disadvantaged youth to displaced auto workers, to prisoners, all of which are governed by a host of separate regulations. If higher education is added to the mix, the entire "workforce preparation system" grows even larger and more complex. In California, there are 25 programs, administered by 14 agencies, serving about 7.9 million people. Recently, both President Clinton and Congress have introduced legislation to simplify and streamline the administration, regulation, and funding of training programs.

Researchers and policy analysts recognize that to streamline and rationalize the system, policy makers need clear, consistent, reliable measures of the system's performance. The National Governors Association has published a study which concluded that accurate, reliable outcome measures are essential to improve and coordinate education and training programs. The report accurately points out that public programs have been evaluated traditionally on input measures, such as the number of computers available or qualifications of instructors, or process variables, such as the number of hours of training delivered or clients served, rather than on outcome measures such as post-training employment and earnings.

The California Employment Training Panel (ETP) is a unique training program in that it has been designed to be driven by performance. Its most prominent feature is the fact that training agencies are only paid for the training they provide if the trainee is placed and retained on a related job for ninety days. This stiff performance requirement sets ETP apart from most other public training programs. ETP's legislation also mandates that it:

> Provide for evaluation of projects funded by this chapter. The evaluation shall assess the effectiveness of training previously funded by the panel to improve job security and stability for workers, and benefit to participating employers and the state's economy, and shall [analyze the pre and post-training] wages of trainees ..... in the department's unemployment insurance tax records.

Over the last three years ETP has met and gone beyond this mandate by funding a series of studies to look at the longer-term outcomes of ETP training for the trainees and the larger California economy. ETP and its evaluations have much to contribute to the current discussion about performance driven accountability for job training programs. This report illustrates a variety of ways in which the outcomes of job training can be

assessed in both the intermediate and long term. The methods employed here illustrate one way to develop a system of core measures which could cut across a host of programs and provide policy makers with a consistent set of outcome measures.

Objectives and Method

The goals of this study are substantially more ambitious and complex than earlier studies. The primary goal of this study is to track to the labor market experience of ETP trainees from 1989-90, 1990-91, and 1991-92 to measure the impact of ETP training on individual trainees through 1993 and to estimate ETP's impact on the California economy. A more precise measure of the impact of ETP training is provided this year by a control group of 130,000 randomly selected California workers against whom the experience of ETP trainees is compared. A secondary goal of the study is to model a sophisticated outcomes assessment system which is capable of tracking the labor market outcomes of training for an extended period.

This study constructed three control groups from the random sample of 130,000 California worker to determine the effects of ETP training on the three cohort groups and on the California economy. The effects of ETP training on the trainees were revealed by comparing the experiences of the particular trainee cohort group to those of the relevant control group. The effects of training are combined with reasonable economic assumptions to determine the impact of the ETP programs on the California economy.

Conclusions

1. Increased employment stability is a major benefit of ETP training.

The analysis presented here shows convincingly that workers who complete ETP training are more likely to remain in the California labor market than either trainees who drop out or randomly selected workers from the same industries. ETP training probably enhances stability in two ways. First, it gives workers skills that have value in the labor market, making trainees more likely to remain employed. Second, training probably contributes to the success of companies which have ETP projects, thus making them more stable employers. More successful companies will be better able to retain workers and reward them with higher pay over time.

The incidence of multiple employers is reduced after training for those who complete training, indicating that these successful trainees change jobs less often and are less likely to have to moonlight to make ends meet or patch together two part-time jobs to earn a living.

2. ETP Trainees who complete have larger earnings increases than either those who drop out or workers in the control group.

ETP trainees who complete earn more after training than similar workers who drop out of training or randomly selected workers from similar industries. We have estimated the impact of training different ways: making comparisons of Completers pre-training and post-training earning and comparing those who complete to those who drop out, as well as to the control group.

3. ETP training continues to have an positive and impressive impact on the California economy.

We estimated the economic impact of ETP training for the most recent cohort of trainees in the year immediately after training and, as we found in earlier studies (Moore, Blake and Phillips, 1994), training had an impact that far exceeded its cost. We estimated the total impact of 1991-92 trainees to be over $202 million in the just first year after training, while training cost the state only about $35 million.

From a long-term, cost-benefit perspective, ETP training also produces impressive results. We estimated that the ETP training provided to the 1991-92 cohorts would yield a $234.7 million in productivity gains alone for employed California workers over the following 12 years. This impressive productivity gain was obtained at a cost of about $35 million in UI-generated funds plus the additional costs of training that were borne by the firms and the trainees themselves. While this study does not attempt to estimate those additional costs, reasonable estimates would probably place these cost below the $35 million outlay in UI funds. Even if the additional costs were twice the $35 million outlay, the training would be a terrific deal for California and its labor force. ETP programs would be an investment in training that returned around $2.50 in present value terms for every dollar invested by everyone involved (and this return grows to $3.50 for every $1 invested if multiplier effects are taken into account)

4. During the three years studied ETP seemed to shift its emphasis away from non-basic service industries towards greater investment in basic industries.

As we and other researchers have noted, for ETP to maximize its impact on the California's economy, it should invest as much as possible in basic industries. Basic industries are businesses which either export their goods and services out-of-state or replace goods and services which are currently imported into the state, and activity in these industries boosts demand for local suppliers and gives rise to multiplier effects. Our analysis of the industrial distribution of the trainees show a shift away from traditionally non-basic industries toward traditionally basic industries over the three years studied. For example, in 1989-90 almost a quarter of ETP trainees were working in jobs in the retail

industry--a non-basic industry-- when they completed training. In the same year less than ten percent ended up working in electrical manufacturing, which includes many critical high-tech industries, which are basic. Three years later, in 1991-92, less than ten percent of trainees were working in retail and over fifteen percent in electrical manufacturing.

5. This study illustrates that Unemployment Insurance databases are powerful tools for measuring the outcomes of training.

These results convince us that Unemployment Insurance wage databases and claims databases provide a valuable method for tracking the experience of trainees for extended periods of time after training. We were able to track trainees for three years. In addition, the data from these sources can be used to generate a variety of measures that look at different aspects of the employment experience. Earnings measures can be used to track trends in earning annually or by the quarter. In combination with other data about the trainees, they can identify characteristics of trainees who earn more or less. Employer Standard Industry Classification (SIC) codes allow researchers to look at industry trends, or to track the movement of trainees from one industry to another. Data on unemployment insurance claims provide various measures of employment stability, as well as the length of unemployment and the cost of unemployment to the state, and of course the impact of training on employment. Finally, we discovered that by tracking the number of earning reports each quarter, we created measures of multiple jobbing which in turn created an additional measure of employment stability.

Perhaps most importantly, this study illustrates how these databases can be used to create a control group against which the experience of trainees can be measured. A major problem in the evaluation of job training programs is estimating what would have happened to trainees if they had not been trained. Creating a control group of workers from similar industries goes a long way toward answering this critical question.

Introduction

Accounting for Training

Federal and state job training, employment and vocational education policies create a patchwork of programs, many aimed at particular populations ranging from disadvantaged youth to displaced auto workers, to prisoners, all of which are governed by a host of separate regulations. If higher education is added to the mix, the entire "workforce preparation system" grows even larger and more complex. In California the State Job Training Coordinating Council (SJTCC) reports there are 25 programs, administered by 14 different agencies, serving about 7.9 million people at a cost of about $15.9 billion a year. (State Job Training Coordinating Council, 1995). The need to rationalize and coordinate this plethora of programs is apparent to policy makers from all points on the political spectrum. In 1994 President Clinton submitted to Congress the "Reemployment Act of 1994" which proposed to consolidate a variety of federal programs and streamline the employment service. Recently the Republican Congress began work on legislation to collapse a variety of federal programs into one or more block grants.

Researchers and policy analysts recognize that to streamline and rationalize the system, policy makers need clear, consistent, reliable measures of the system's performance. The National Governors Association has taken the lead in addressing this issue. In 1994 it published Building State Workforce Development Systems Based on Policy Coordination and Quality Assurance (Baj, Sheets and Trott, 1994), a study which made an extensive review of the policy issues involved in trying to improve the quality of public education and training programs by improving coordination and measuring outcomes. The study concludes that accurate, reliable outcome measures are essential to improve and coordinate education and training programs. The report accurately points out that public programs have been evaluated traditionally on input measures, such as the number of computers available or qualifications of instructors, or process variables, such as the number of hours of training delivered or clients served. There were few systematic attempts to manage training programs by assessing the outcomes until the 1980's, when JTPA attempted to develop performance standards which measured completion, placement, and wages at placement for all local JTPA programs.

Tracking these national trends, the California Senate in 1994 passed Senate Bill (SB) 1417[1] which called on the State Job Training Coordinating Council to make recommendations on the development of performance-based accountability for state and federal employment and training programs which could be used to create an integrated employment and training system in California. The SJTCC has responded with a draft

[1]Chapter 819, Statutes of 1994.

report, Response to Senate Bill 1417: Developing a New Workforce Preparation System, which makes a variety of recommendations for creating a performance-based accountability system. The report suggests two types of outcome measures: measures related to labor market outcomes such as earnings, and those related to skill attainment such as being able to keyboard at a certain rate per minute. The report acknowledges that many outcome measures will have to be unique to the individual programs but they suggest that a series of "core outcome measures" that cut across all programs be developed.

While there is a strong consensus that some set of core measures, on which all programs can be compared, will be essential for policy makers and program managers, profound disagreement is likely to emerge when the discussion turns to exactly what should be measured and how. For example: Should policy makers be concerned with immediate outcomes only or should the focus be on longer-term outcomes that may occur two, three or more years after training? Does the training of new workers displace established workers and can this effect be measured? Is the impact of training on the trainee the only concern? What about the impact of training on company productivity and the economy as a whole?

Technical questions about what can and should be measured will also emerge. Should measurement focus on the skills that trainees acquire or on labor market outcomes such as placement and earnings? If labor market outcomes are to be measured, which outcomes should be measured and how? Should policy makers rely on surveys or should they use available data from the unemployment insurance system? How should the limits of any data collection measure be accounted for in the system? What should be measured, hourly wages, monthly earnings or annual earnings? Should policy makers be concerned about trainees finding employment related to training or is any job satisfactory? Is it a positive outcome or a negative outcome if trainees have more than one job after training?

The limited experience of most training programs with long-term, systematic outcomes assessment makes it difficult to answer these questions. Yet, the need to answer these questions becomes more pressing as the federal government moves towards consolidating a host of federally funded employment and training programs into a single block grant. In the words of the SJTCC:

> It is doubtful that the federal government would institute a program of block grants without requiring a performance-based accountability system to assist policy makers in evaluating the quality, cost, and results of the services provided with those block grants. Should federal legislative changes occur before California takes the first steps in developing a performance-based accountability system, the federal government may mandate a system that does not meet California's needs.

California Employment Training Panel

The California Employment Training Panel (ETP) is unique in that it has been designed, since its inception in 1982, to be driven by performance. Its most prominent feature is the fact that training agencies are only paid for the training they provide if the trainee is placed and retained on a related job for ninety days. This stiff performance requirement sets ETP apart from most other public training programs. ETP's interest in measuring performance goes beyond tracking trainees for the required 90 days. ETP's current legislation mandates that it:

> Provide for evaluation of projects funded by this chapter. The evaluation shall assess the effectiveness of training previously funded by the panel to improve job security and stability for workers, and benefit to participating employers and the state's economy, and shall compare the wages of trainees in the 12 month period prior to training as well as the 12-month period subsequent to the completion of training, as reflected in the department's unemployment insurance tax records.[2]

Over the last three years ETP has met and gone beyond this mandate by funding a series of studies to look at the longer-term outcomes of ETP training for the trainees and the larger California economy. Given its long-term focus on performance outcomes and its investment in research on measuring outcomes, ETP has much to contribute to the current discussion about performance driven accountability for job training programs. This report illustrates a variety of ways in which the outcomes of job training can be assessed in both the intermediate and long term. The methods employed here illustrate one way to develop a system of core measures which could cut across a host of programs and provide policy makers with a consistent set of outcome measures.

Study Objectives

During this century the California economy has moved from an agriculture and extraction-based economy to one dominated by manufacturing and business, professional, and personal services. Tomorrow California may be dominated by entertainment, communication, high tech manufacturing, international trade and finance, and medical equipment and services, among others. Economic transformations usually occur gradually and are facilitated by the areas of growth attracting new workers, while natural attrition reduces the workforce in the contracting industries. But episodes of rapid structural transformation do occur, and usually involve the rapid growth of an industry or two, such

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[2]Division 1, Part 1, chapter 6, Article 6 of the Unemployment Insurance Code, 10205(g).

as the rapid growth of the oil industry, the computer and microchip industry, Pacific rim international trade, and the defense industry. These episodes spawn local economic booms, spurts of immigration, and local commercial and residential building binges, not unlike California in the mid-1980s.

However, during the period studied here, rapid structural change in California's economy has occurred during the worst recession the state has experienced in several decades. The concurrent timing of the structural change and the severe recession is no coincidence. Defense contracts and spending in California peaked in the 1985-88 period and have declined over 20 percent since then. Defense-related manufacturing employment began to decline immediately, but the other manufacturing and construction sectors continued to grow along with trade and service employment, to produce overall nonagricultural employment growth in California which peaked in mid-1990. Employment began to decline with the onset of the national recession of 1990-91 and the California recession of 1990-1993. Unemployment in the state virtually doubled, moving from its low of 5.1 % in 1989 and in mid-1990 to the high near 10 percent in 1992, and remaining in the range of 9 to 10% throughout 1993. Even while total employment grew after hitting its low in March 1993, adding about 150,000 nonagricultural jobs though the remainder of 1993 and 1994, California manufacturing employment continued to decline, losing 75,000 jobs in the same period.

Clearly California's severe recession masked a structural transition and one that seems to be continuing. The evidence is compelling: for the mid-1990 to 1993 period, jobs declined 30% in aerospace manufacturing, 20% in construction, 9% in non-aerospace manufacturing, 7% in wholesale and retail trade, but jobs grew nearly 3% in services during the same period, with health care and the entertainment sectors leading the growth. The job losses compare to an overall 4.7% decline in California jobs. These differential job loss and growth rates signal a structural shift that seems to be continuing as California emerges from the recession. During most of 1994 manufacturing employment declined at just less than a 2% rate, high tech manufacturing declined at an 8% rate, while services grew at over a 2% rate. As the economic structure continues to shift, people in the hardest hit industries will seek jobs in other industries and occupations for which they may need new skills. People who stay in the hard hit industries will want to upgrade their skills to sharpen their competitive edge in a contracting industry.

The goals of this study are substantially more ambitious and complex than earlier studies (Moore, Blake & Phillips, 1994 and Moore & Blake, 1993). The primary goal of this study is to track to the labor market experience of ETP trainees from 1989-90, 1990-91, and 1991-92 to measure the impact of ETP training on individual trainees through 1993 and to estimate ETP's impact on the California economy. A more precise measure of the impact of ETP training is provided this year by a control group of 130,000 randomly selected California workers against whom the experience of ETP trainees is

compared. A secondary goal of the study is to model a sophisticated outcomes assessment system which is capable of tracking the labor market outcomes of training for an extended period.

Specifically, this study addressed the following research questions:

1991-92 ETP Trainees

1. Did the 1991-92 ETP trainees experience the gains in employment and earnings found in earlier cohorts?

2. What individual and program characteristics were associated with increases in earnings for 1991-92 trainees?

3. How did the changes in earnings and employment for ETP trainees compare with a similar group of randomly selected California workers?

4. What impact did ETP training have on the employment stability of trainees?

5. What impact did ETP training in 1991-92 have on the California economy?

1989-90 and 1990-91 ETP Trainees

6. Did the earnings and employment gains that were found for 1989-90 trainees persist into the second and third year after training?

7. How did the changes in earnings and employment for 1989-90 and 1990-91 ETP trainees compare with a similar group of randomly selected workers?

8. What impact did ETP training have on the employment stability of 1989-90 and 1990-91 trainees?

Project Outcomes

9. What were the average changes in earning and employment for each ETP project which was completed in 1989-90, 1990-91 and 1991-92? (Reported in a separate document, ETP Project Outcomes, 1989-90, 1990-91, 1991-92.)

Methods

This study used three control groups to determine the effects of ETP training on the three cohort groups and on the California economy. The effects of ETP training on the trainees were revealed by comparing the experiences of the particular trainee cohort group to those of the relevant control group. The effects of training are combined with reasonable economic assumptions to determine the impact of the ETP programs on the California economy.

Specifically, the earnings, weeks of Unemployment Insurance (UI) claims, UI payments, number of employers in each quarter, and labor force persistence experiences of the cohort groups both before and after training were compared to the similar experiences of the three control groups before and after a calendar period comparable to the training period.

The three specially constructed control groups were derived from a single 1-in-100 sample of California UI-covered workers which we called the "basic" control group. The UI-covered workers form an appropriate population for comparison because the ETP training is funded by the Unemployment Insurance system and ETP trainees have to be UI-covered workers. The sample was drawn from California workers who either received UI-covered wages or UI payments in the second quarter of 1990. This quarter was selected for its rough correspondence to the average start of training for many of the workers covered by this study.

To construct the three different control groups, the basic control group was broken down into 2-digit Standard Industrial Classification (SIC) code categories. The 2-digit groups were then clustered into 20 SIC code groups based on the degree of similarity of the 2-digit industries and on the relative populations of the three training cohort groups that would fall into each of the designated SIC groups. These 20 SIC groups formed the building blocks for the three control groups.

The three different control groups were then constructed in two steps. The first step was to determine the average earnings, UI-claims, UI-payments, number of jobs, and labor force persistence experience for each of the 20 SIC groups. The second step was to weight that experience by the proportion of the particular trainee cohort group that fell into that same SIC group. Since the average experiences of the workers in the 20 SIC groups differed from one-another, as did the proportion of the trainees in each SIC group for each of the cohort groups, this methodology yielded three different control groups experiences.

Each of the constructed control groups corresponds to the ETP training group with the same industrial composition.

The experience of each of these constructed control groups matches the expected experience that its corresponding ETP training cohort would have had if training had not occurred. (Note that this methodology is particularly efficient in the use of the available information since it uses all of the experiences of the basic control group to develop each of the three control groups. Other methods may match members of the training groups to members of the control group and disregard the experiences of unmatched members of the control group.)

This methodology differs from that used in two previous reports (Moore and Blake, 1992; and Moore, Blake, and Phillips, 1994) because control groups were not used in the previous studies to determine the experience that trainees would have had if they had not participated in ETP training. Instead the previous studies employed two different methods for estimating the impact of training. The first method compared the post-training experience directly to the trainees' pre-training experience and attributed any difference in earning, UI claims, and UI payments to the completion of training. In the California environment of falling real wages and rising UI claims and payments, these seemed appropriate and conservative estimates of the impact of training. The second method tracked the pre-training and post-training experience of the training dropouts and compared those experiences to those of the training completers. One could argue that the training dropouts were similar in virtually every respect to the completers except that the dropouts did not complete the ETP training. Thus a comparison of the completers and the dropouts would also estimate the effects of training.

The results of these two methods were reported in the previous studies. The absolute changes in earnings, UI claims, and UI payments for the completers were reported and were compared to those of the dropouts. In each instance, the lesser of these two results was reported as the estimated impact of training. In virtually all cases the lesser estimate was the absolute change in earnings, UI claims, and UI payments for the completers because the dropouts usually experienced decreased earnings, and increased UI claims and payments in contrast with the experience of the completers.

We believe that the control group methodology in this year's analysis offers a superior approach to determining the impact of training as it tracks similar workers over a similar period of time and compares the trainees' experiences to the control group's experiences in the same economic environment. However, the absolute change in earnings, UI claims, UI payments, and the other variables for the completers and for the dropouts are reported in this study. Interested readers can compare the results of using the control groups with that of the formerly used methodology.

In the previous two studies, the experiences of the ETP trainees who completed training and were placed for a minimum of 90 days were compared to the experiences of two groups--ETP dropouts and the "average California worker." ETP dropouts were ETP trainees who did not finish training and 90 days of employment in a training related job. The experience of the "average California worker" was developed from available statistical sources and included the average weeks of unemployment for UI-covered workers and for the California labor force (as surveyed by the Bureau of Labor Statistics), along with average wage data for California manufacturing workers and wholesale trade workers. For each comparison with the ETP trainees who completed training, the most conservative comparison was used.

Results: 1991-92 Trainees

This section examines the outcomes for trainees in the 1991-92 cohort in a number of areas. Specifically, it analyzes completion rates for New Hires and Retrainees. Next it compares the characteristics of New Hires and Retrainees. Finally it compares the characteristics of Completers and Dropouts in each of the two groups.

Program Completion

Overall, 77% of the people who began ETP training completed the training. The percentage of completions were quite different for the Retrainees and the New Hires in the 1991-92 cohort. Retrainees were much more likely to complete the training than New Hires. Retrainees had a high completion rate of 80% while New Hires had a significantly lower completion rate of 56%. (See Table 1).

The overall 1991-92 cohort completion rate (77 %) is similar to the 74 % rate achieved by the 1990-91 group. However, the completion rates for the Retrainees and New Hires groups have changed significantly from 1990-91 to 1991-92. In 1990-91 Retrainees (74 %) were only slightly more likely than New Hires (73 %) to complete. In 1991-92 the gap widened to 80 % for Retrainees and 56 % for New Hires.

Trainees By Industry

This year the study was able to identify the industry in which the trainee worked in the quarter after training. The Figure 1 shows the distribution of trainees, both Completers and Dropouts, by industry group. The graph reveals that in 1991-92 ETP was moving toward a heavier concentration in manufacturing and construction and away from Hotel and Retail industries. ETP trainees were represented disproportionately in construction, manufacturing of food and related products, electrical manufacturing, and transportation equipment manufacturing (which includes aerospace). In the service areas ETP trainees were found disproportionately in banking and wholesale industries. Overall we estimate that 61.5% of all trainees were working in basic industries in California.

Table 1
All 1990-91 Trainees by Eligibility Category and Outcome

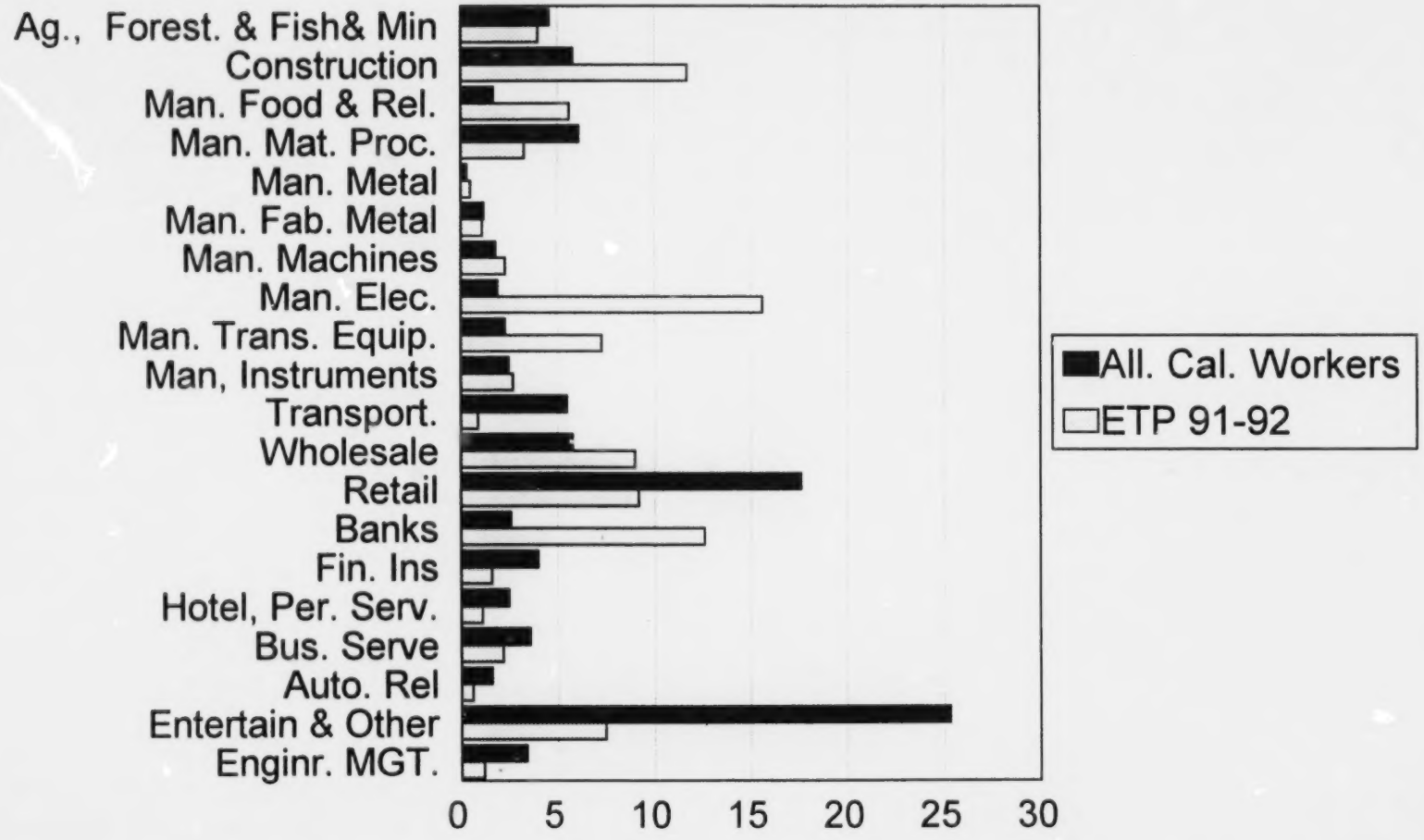
	Retrain	New Hire	Total
Complete	80.4% (14,571)	56.0% (1,681)	77.3% (16,252)
Dropout	19.6 (3,547)	44.0 (1,238)	22.7 (4,785)
Total	100.0 (18,118)	100.0 (2,919)	100.0 (21,037)

A complete description of how Retrainees and New Hires differed from each other as well as a description of how Completers and Dropouts differed is included in Appendix A: Analysis of Trainee Characteristics.

Employment Stability

Employment stability is a key outcome measure for ETP training. We found that ETP trainees who completed training had substantially more employment stability than Dropouts or workers in the Control group. Workers benefit from stable employment through increased earnings and more job security. The state benefits from reduced unemployment insurance costs and increased economic growth. A key measure of stability is whether or not trainees remained in the California labor market. This measure is important because as long as trainees remain within the California labor market, their training may contribute to the state's economy. We examined the rate at which trainees remained in the labor force by checking each quarter before and after training to see if either wages or UI payment were reported for the trainee. If either measure was present, the trainee was classified as in the labor market.

Figure 1
Industry Distribution
All California Workers and 1991-92 Trainees



We measured employment stability two ways. First we calculated the proportion of trainees and Controls who were in the California labor market four quarters before training and four quarters after training. Second, we looked at the proportion of trainees and Controls who were in the California labor market each quarter.

As Figures 2 and 3 indicate, both Retrainees and New Hires who completed were far more likely to be in the California labor market both four quarters before training and four quarters after training than Dropouts or the Control group. Over 90% of the Retrainees Completers were in the California labor market four quarters before and four quarters after training, compared to 88% for the Controls and only 78% of Retrainee Dropouts. The New Hire Completers, with 82% in the labor market for the entire period, were lower than the Control group but compared very favorably to the New Hire Dropouts with only 61% in the labor force for the same period.

A quarter-by-quarter analysis shows patterns of stability for both trainees and Controls. It is important to note that this analysis is not restricted to the trainees found four quarters before training, four quarters after and eight quarters after. Figures 4 and 5 show the percent of trainees found each quarter. Hence a trainee may leave the labor market and then return and be counted again in this analysis. Prior to training Retrainee Completers and Dropouts were about equally likely to be in the labor market and both were more likely to be in the labor market than Controls. Four quarters after training a much larger proportion of Retrainee Completers (94%) remained in the labor market than did Retrainee Dropouts (82%), whose participation had fallen to about that of the Controls (80%).

Figure 5 reveals a similar pattern for New Hires. While New Hire Dropouts were more likely than Completers to be out of the labor force prior to training, after training the gap broadened significantly. Four quarters after training, 90% of New Hire Completers were still in the California labor market compared to only 69% of Dropouts. Prior to training both groups were close to the labor force participation of the Controls, but after training Completers were far more likely to be in the labor market than the Controls while Dropouts were far less likely to be in the labor market than Controls.

Figure 2
In Labor Market Four Quarters Before and Four Quarters After Training

1991-92 Retrainees

Compare to Controls: 87.7% in the labor market
12.3% not in the labor market

Figure 3
In Labor Market Four Quarters Before and Four Quarters After Training

1991-92 New Hires

Completers

Drops

Compare to Controls: 87.7% in the labor market
12.3% not in the labor market

Annual Earnings Pre and Post Training

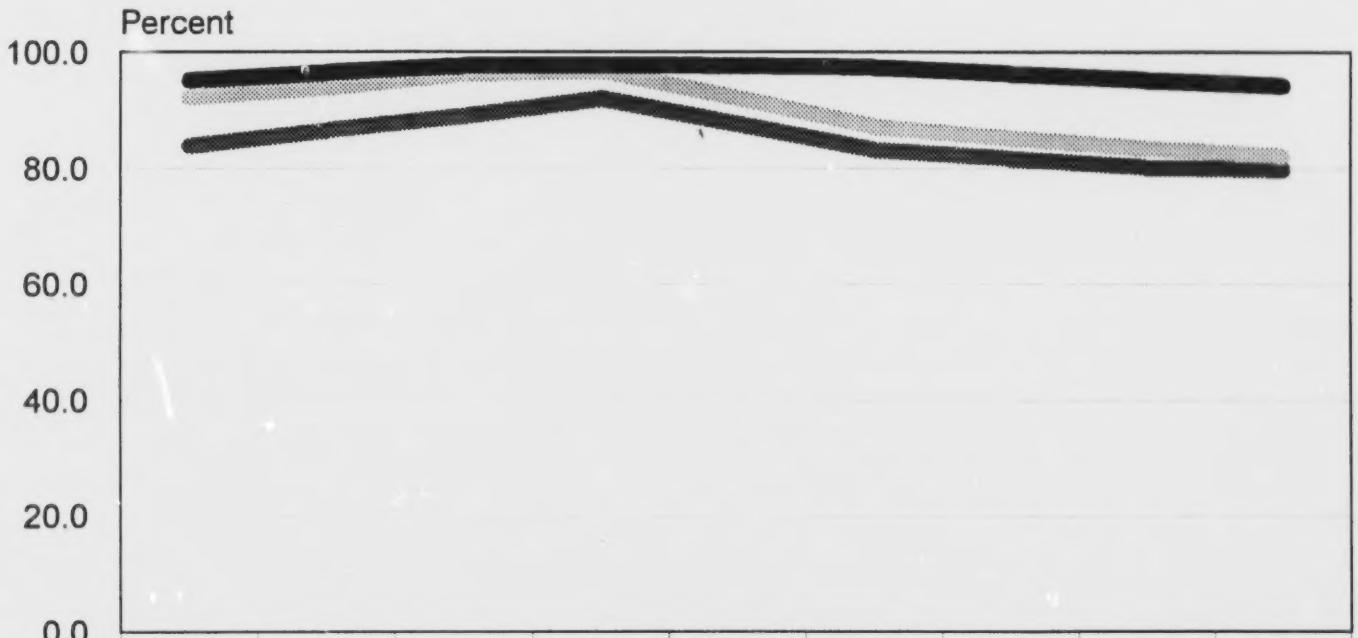
The earnings data presented here is for trainees and Controls who were in the California labor market four quarters before training and four quarters after training. Thus, these data represent a much larger proportion of the Completers than the Dropouts or Controls since more Completers remained in the labor force. We chose this method as the most conservative way to estimate the impact of training on earnings since it excludes the many Dropouts and Controls who disappeared from the labor market in the year after training or who had no earnings in the fourth quarter before or after training. Had those workers been included, the earnings differences between Completers and the Dropouts and Controls would be much greater.

In order to compare earnings from different years, earnings are frequently adjusted to "constant dollars" or "real dollars" to remove the effects of inflation from the data. Since the earnings reported here range from 1987 to 1993, we adjusted the earnings to 1990 dollars so the earnings reported here are free from any bias introduced by changing price levels.

Analysis of real (inflation adjusted) earnings for trainees and Controls in the labor market four quarters before and four quarters after training shows that both Retrainee Completers and New Hire Completers had gains in real earnings while Dropouts and Controls had a decline. Retrainees who complete training had slightly more than a $300 or 1% gain in earnings in the year after training, while Retrainee Dropouts had over a $2,600 decline. The Control group had a decline in earnings of $500 in real terms. New Hire Completers had an earnings increase of over $2,600, while Dropouts had a decline of over $2,300.

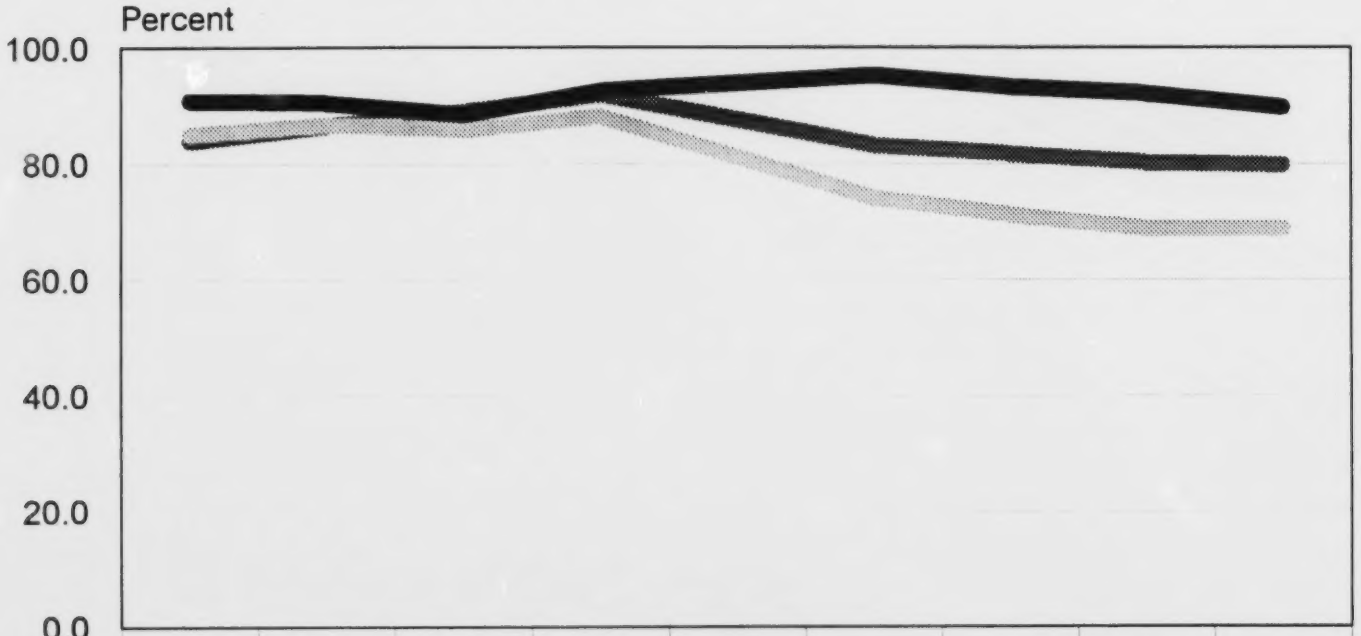
Based on these figures, there are several ways to think about the impact of training on earnings. First we could simply look at the increase in earning for Completers from the year before to the year after. This shows the modest gains for Retrainees and substantial gains for New Hire Completers reported before. If we assume that if Completers had not been trained they would have had the same experience as Dropouts, we would take the difference between the change in Completer and the change in Dropout earnings to estimate the impact of training. This yields much larger impacts for Retrainees of $2,900, an increase of almost 10%. Similarly, New Hires who completed had an increase of $4,900, an increase of over 34%. A second approach is to assume that without training, Completers would have the same experience as the Control group. Thus the impact would be the difference between the change in Completers' earnings and the change in Control group earnings. This method yields an increase of about $800 for Retrainee Completers or 2.6%. For New Hires this comparison yields an increase of over $3,000 or 21%. In any case, it appears that training did contribute to some significant increase in earning for those who completed training.

Figure 4
Percent in Labor Market Before and After Training
1991-92 Retrainees



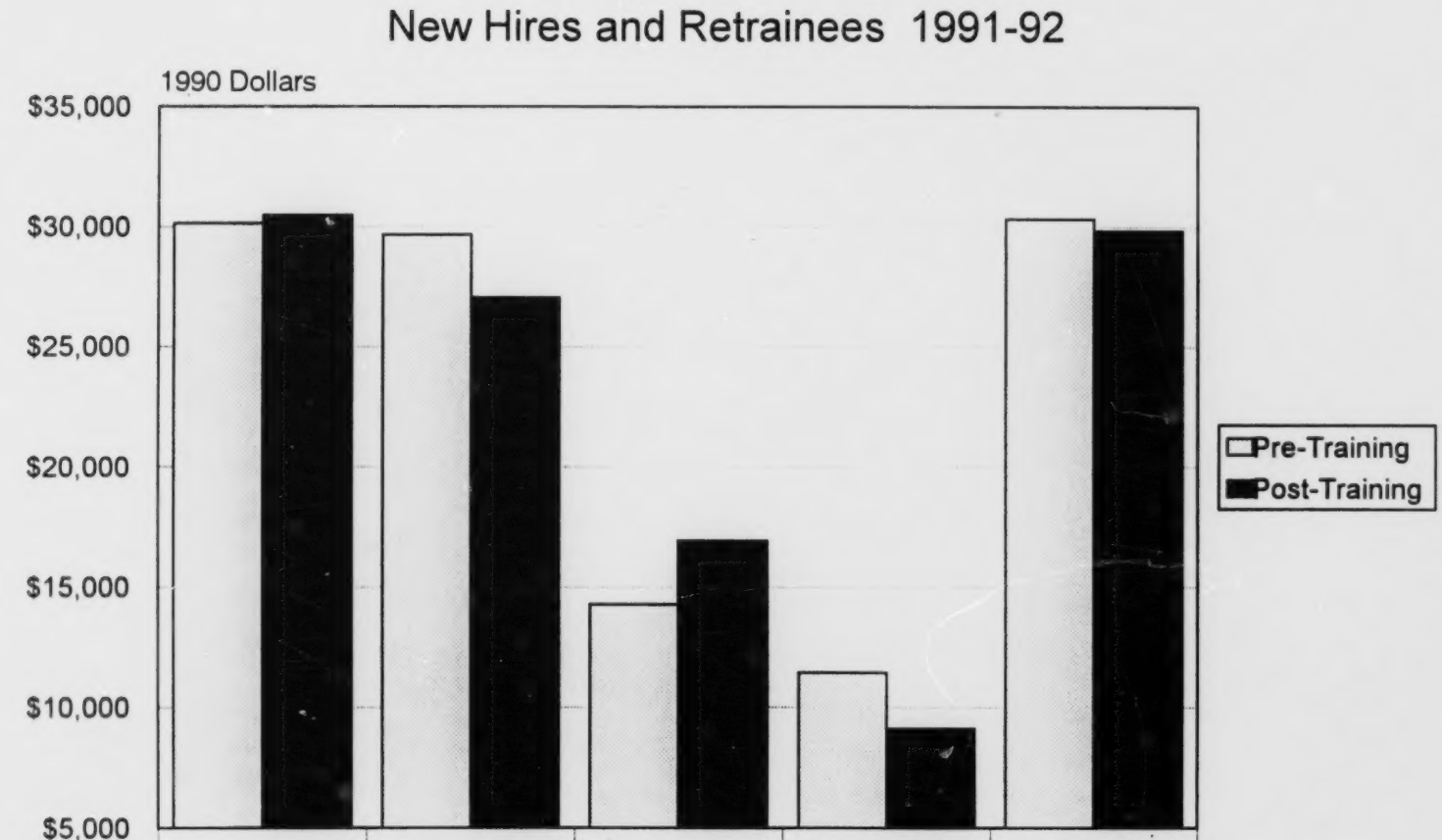
	-4	-3	-2	-1	Training	1	2	3	4
Completers	95.1	96.5	97.7	97.8	.	97.3	96.2	95.1	94.1
Drops	92.2	93.8	96.2	96.9	.	87.1	85.2	83.4	82.0
Control Group	83.8	86.5	88.9	92.0	.	83.1	81.6	80.1	79.6

Figure 5
Percent in Labor Market Before and After Training
1991-92 New Hires



	-4	-3	-2	-1	Training	1	2	3	4
Completers	90.8	90.4	88.4	92.5	.	95.2	93.2	92.0	89.7
Drops	85.0	86.7	85.8	88.2	.	74.1	71.1	68.8	68.8
Control Group	83.8	86.5	88.9	92.0	.	83.1	81.6	80.1	79.6

Figure 6
Annual Earnings



	Ret. Comp.	Ret. Drop	N Hire Comp.	N Hire Drop	Control
Pre-Training	$30,148	$29,668	$14,264	$11,405	$30,323
Post-Training	$30,474	$27,038	$16,914	$9,105	$29,827

A more puzzling question is why these earnings increases are smaller than those found in previous studies (Moore, Blake & Phillips, 1994). The most likely explanation is that continued recession and economic restructuring during 1993 held earnings down for Completers. A second potential explanation is that the change in the mix of projects, with more projects in manufacturing and construction and fewer in service industries, accounted for the smaller change in earnings. Possibly, it is a combination of both these factors.

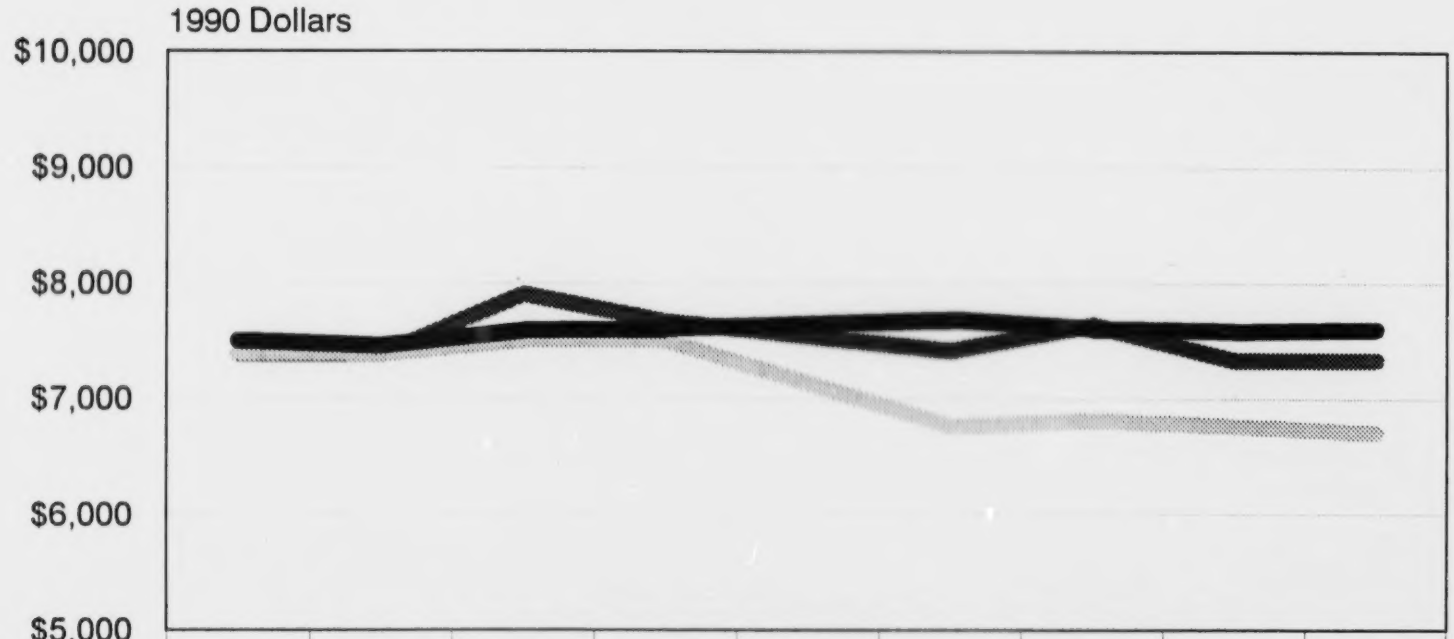
However they are measured, these changes in earnings indicate to us that ETP training has had a positive impact on trainee productivity. Economic analysis indicates that wage levels are related to worker productivity in competitive labor markets. This implies that training programs that produce changes in worker productivity ought to produce changes in wages. Since the ETP training programs are designed to enhance worker productivity, it is reasonable to expect that successful completion of training will result in higher wages for the Completer. We also expect that the training program Completers will have a greater change in earnings due to the program than the Dropouts or the workers from similar industries in the Control group.

As mentioned before, ETP trainees must be trained, placed on the job, and remain for at least 90 days to qualify as program Completers. ETP Dropouts include trainees who completed formal training, were placed, but did not remain for 90 days, as well as people who received training but were not placed. In some cases, the Dropouts may be workers who completed training, placement, and almost 90 days on the job, but then left to take advantage of a better offer. We do not believe that this would be the average Dropout, but we do expect some portion of the Dropouts to benefit from training about as much as the Completers do. On average, though, the Dropouts probably experience some increase in productivity due to the portion of the training program they experience and will reap the resulting increase in earnings.

Figures 7 and 8 show the quarter-by-quarter differences between the groups. As the graphs indicate, in the quarter before training Retrainee Dropouts and Completers and the Control group all have about the same earnings. After training Dropouts immediately fall below the Control group, while Completers rise slightly above the Controls by earning about $300 more in the fourth quarter after training. Dropouts, on the other hand, fall below the control group and remain there, earning about $600 less than the control group in the fourth quarter after training.

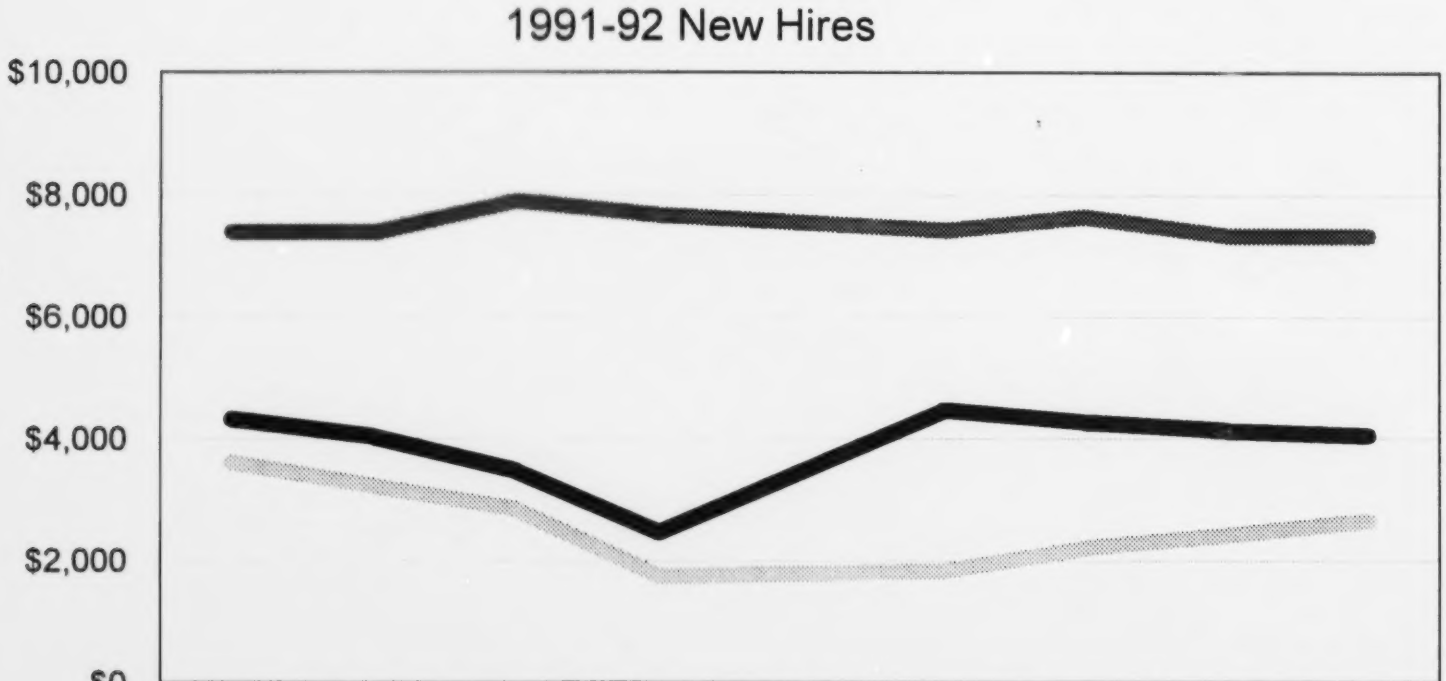
The pattern for New Hires is different. Both Completers and Dropouts have declining earning as they approach training, with Dropouts earning slightly less than Completers and both groups earning substantially less than the Controls. After training Completers get a steep increase in earnings and then essentially stabilize. Dropouts see their earning increase very slowly after training and over the course of the follow-up year

Figure 7
Quarterly Earnings Before And After Training
1991-92 Retrainees



	-4	-3	-2	-1	Training	1	2	3	4
Completers	$7,497	$7,453	$7,590	$7,606	.	$7,685	$7,605	$7,577	$7,604
Drops	$7,393	$7,378	$7,506	$7,497	.	$6,758	$6,813	$6,763	$6,701
Control Group	$7,386	$7,375	$7,899	$7,664	.	$7,414	$7,638	$7,330	$7,339

Figure 8
Quarterly Earnings Before And After Training



	-4	-3	-2	-1	Training	1	2	3	4
Completers	$4,320	$4,022	$3,464	$2,453	.	$4,465	$4,270	$4,122	$4,053
Drops	$3,604	$3,212	$2,839	$1,746	.	$1,829	$2,205	$2,418	$2,652
Control Group	$7,386	$7,375	$7,899	$7,664	.	$7,414	$7,638	$7,330	$7,339

close part of the gap between their earnings and the Completers earnings. Four quarters after training, Dropouts are earning $1,400 a quarter less than Completers.

UI Weeks and Payments

Changes in weeks of unemployment and unemployment insurance payments are another important outcome measure for ETP training. Weeks of unemployment as measured by UI claims were recorded for trainees in the year prior to training and the year after training along with UI payments[3]. Comparisons of the average number of weeks of UI claimed before and after training reveal that while unemployment went up for all groups, probably due to the severe recession in California, unemployment went up much less for Completers than it did for either Dropouts or the Control group.

Figure 9 shows that Retrainees who completed training were unemployed an average of only half a week in the year before training, compared to 1 week for the Dropouts and 1.16 weeks for the Controls. This rose to an average of 2.1 weeks for Completers in the year after training, 5 weeks for Dropouts and 3.6 weeks for Controls.

New Hires who completed dramatically decreased their unemployment from the high levels they experienced before training. The New Hires Completers averaged 10 weeks of unemployment in the year before training, while after training the average fell by over fifty percent to 4.8 weeks. There was essentially no change in unemployment for New Hires who dropped out, going from 10.3 weeks to 10.4 weeks. The Controls experienced a substantial increase in unemployment from 1.16 weeks to 3.6 weeks in the follow-up year.

Figures 10 and 11 show the pattern of unemployment quarter-by-quarter for all four groups. The trend for Retrainees shows that prior to training both Dropouts and Completers were unemployed less than the Controls. After training Completers were unemployed substantially less than the Controls, while Dropouts were unemployed substantially more than Controls. For New Hires the pattern was different. New Hire Completers and Dropouts were unemployed far more than the Controls prior to training. After training Completers dropped immediately to the Control group average while unemployment among Dropouts remained high. A year after training the groups had converged dramatically with Completers then slightly above the Control group (1.73 weeks compared to 1.08 weeks) and the Dropouts still higher (2.32 weeks).

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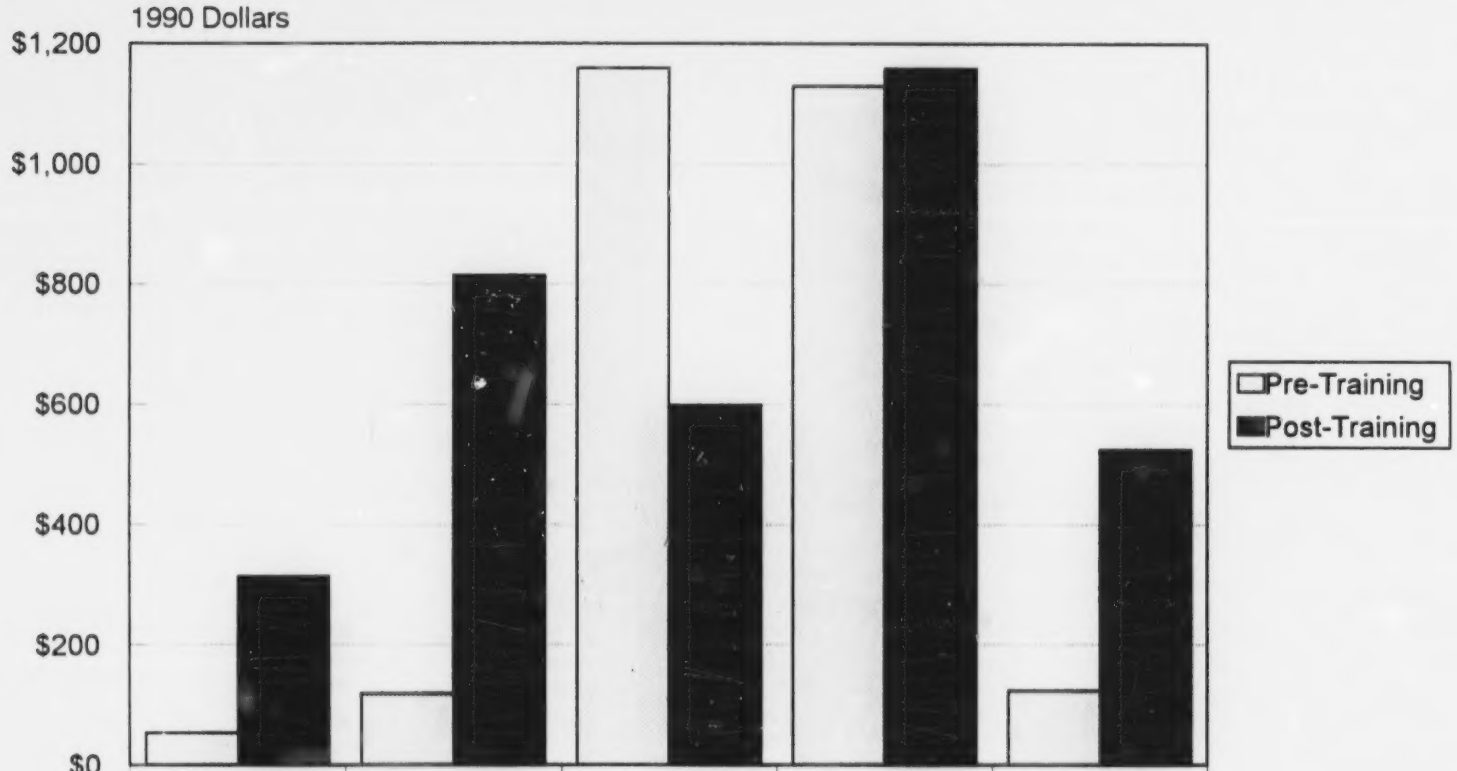
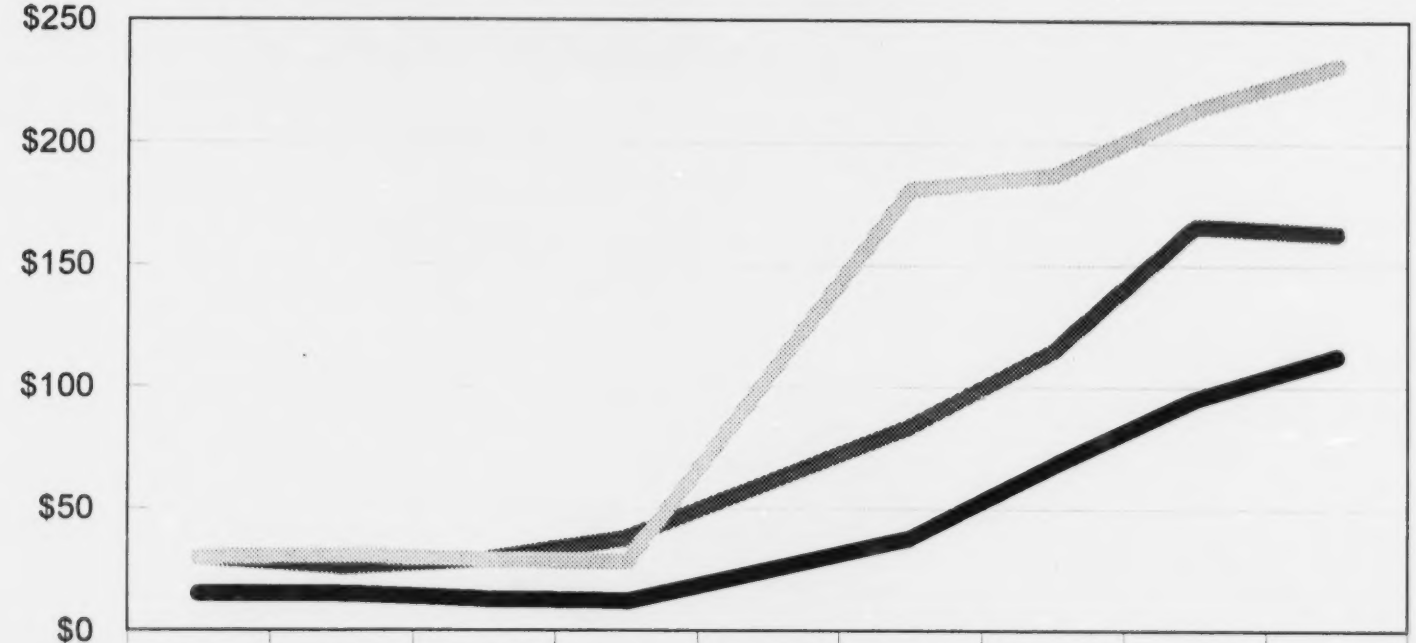
[3] All employment outcome measures are based on trainees who were in the labor market four quarters before training and four quarters after training. This constraint was necessary to make data comparable across the quarters.

Figure 9
Average Annual Unemployment Insurance Payments
New Hires and Retrainees 1991-92



	Ret. Comp.	Ret. Drop	N Hire Comp.	N Hire Drop	Control
Pre-Training	$54	$118	$1,160	$1,130	$123
Post-Training	$313	$814	$598	$1,159	$523

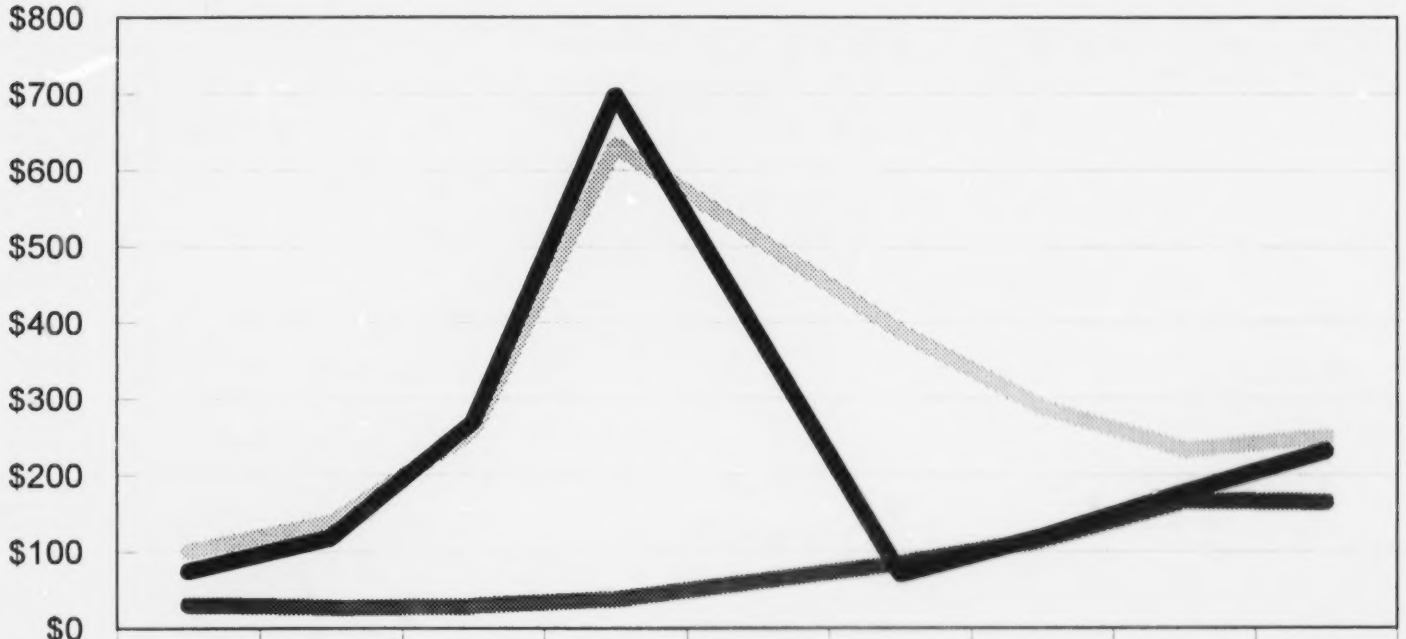
Figure 10
Average Quarterly UI Payments Before And After Training
1991-92 Retrainees



	-4	-3	-2	-1	Training	1	2	3	4
Completers	$15	$15	$13	$12	.	$38	$68	$95	$113
Drops	$30	$31	$29	$28	.	$181	$187	$214	$232
Control Group	$30	$26	$29	$38		$84	$115	$166	$163

Figure 11
Average Quarterly UI Payments Received Before And After Training

1991-92 New Hires



	-4	-3	-2	-1	Training	1	2	3	4
Completers	$74	$118	$270	$698		$70	$119	$177	$232
Drops	$100	$139	$258	$632		$388	$288	$232	$250
Control Group	$30	$26	$29	$38		$84	$115	$166	$163

The average UI payments to the four groups largely reflects the differing patterns of pre- and post-year unemployment experienced by these groups. As shown in Figure 12 the 1991-92 Retrainee Completers had low average UI payments, $54 in the year prior to training, which rose to $313 in the year after. Retrainee Dropouts had a much more dramatic increase from $118 in the year before training to $814 in the year after training, while Controls had their UI payments increase from $123 to $523.

The pattern was different for New Hires. New Hire Completers' average UI payment fell by about 50% from $1,160 before training to $598 after training. Conversely New Hire Dropouts had a high payments before training, $1,130, which then increased slightly after training to $1,159. Control group payment rose substantially from $123 to $523.

The quarter-by-quarter comparison of UI payments made to Retrainee Dropouts and Completers (Figure 12) and New Hire Dropouts and Completers (Figure 13) tracks the earlier pattern identified for weeks of unemployment.

Multiple Employers

Data collected this year allowed us to identify workers who had more than one employer in any particular quarter. Workers may report more than one employer if they changed jobs during the quarter or if they are simultaneously employed by more than one employer. The data presented here simply show the average number of employers reported each quarter for those who reported any earnings.

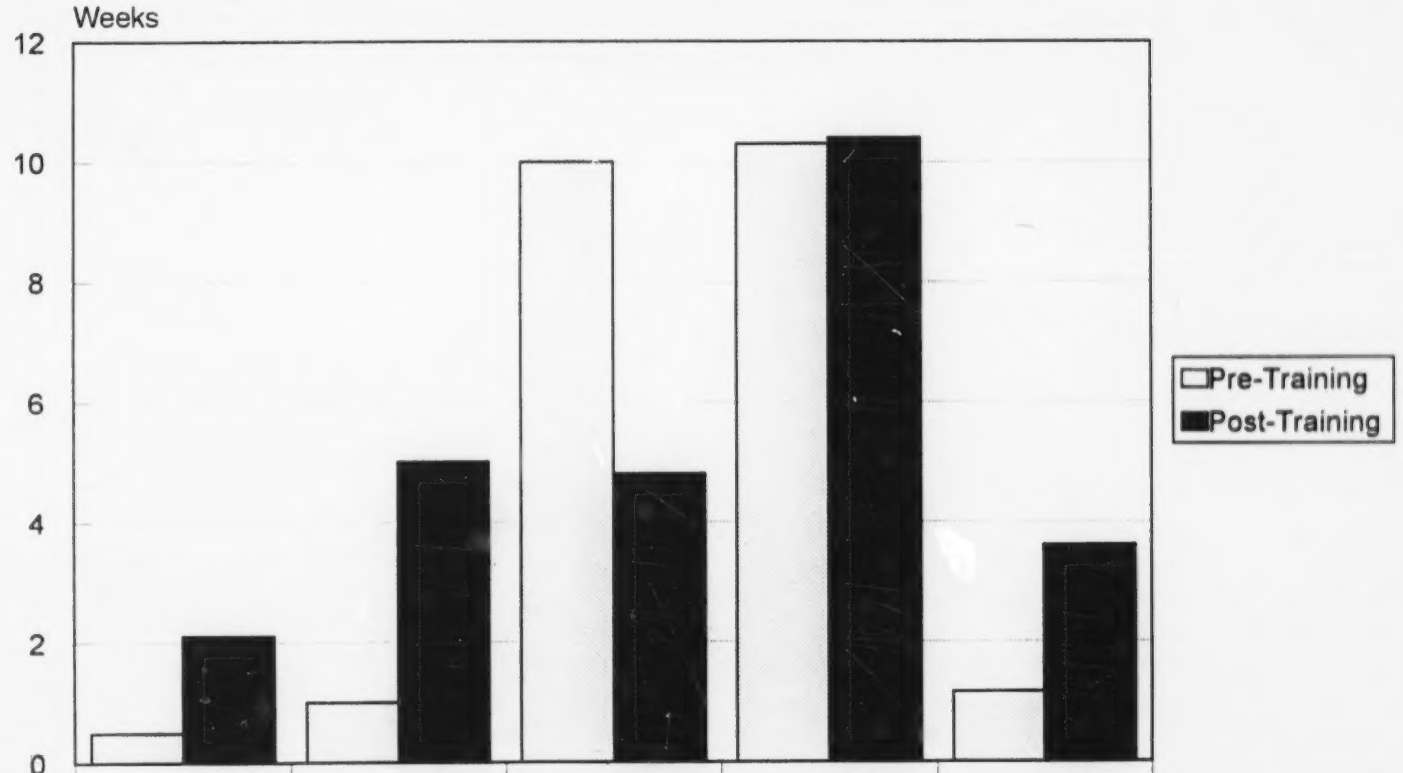
It is difficult to interpret the meaning of changes in the average number of employers. In general, a higher average number of employers may indicate less employment stability. An increase in the average number of jobs may indicate that workers have lost their primary job and are patching together several part-time jobs to make ends meet. It may indicate that workers have had their hours reduced at their regular job and have added a part-time job to make up for lost hours. A final interpretation is that a fully employed worker is moonlighting to make extra money.

Figure 15 shows that the average number of employers for Retrainees and Controls per quarter varies between 1.12 and 1.23. If we assume that most people with more than one employer only have two (which is usually the case), we could interpret these numbers to indicate that between 12% and 23% of workers have multiple employers. The graph shows that Retrainee Dropouts consistently had more employers per quarter than any other group. This group also had higher levels of unemployment and may indicate that Dropouts are more likely to be combining several part-time jobs or changing jobs more frequently then other groups. Conversely, the experience of Retrainee Completers and the Controls are very similar. Interestingly, the number of employers declines slightly for all groups in the year after training. This may be caused by overall improvements in the economy

as California slowly emerged from the recession and more permanent full-time jobs became available.

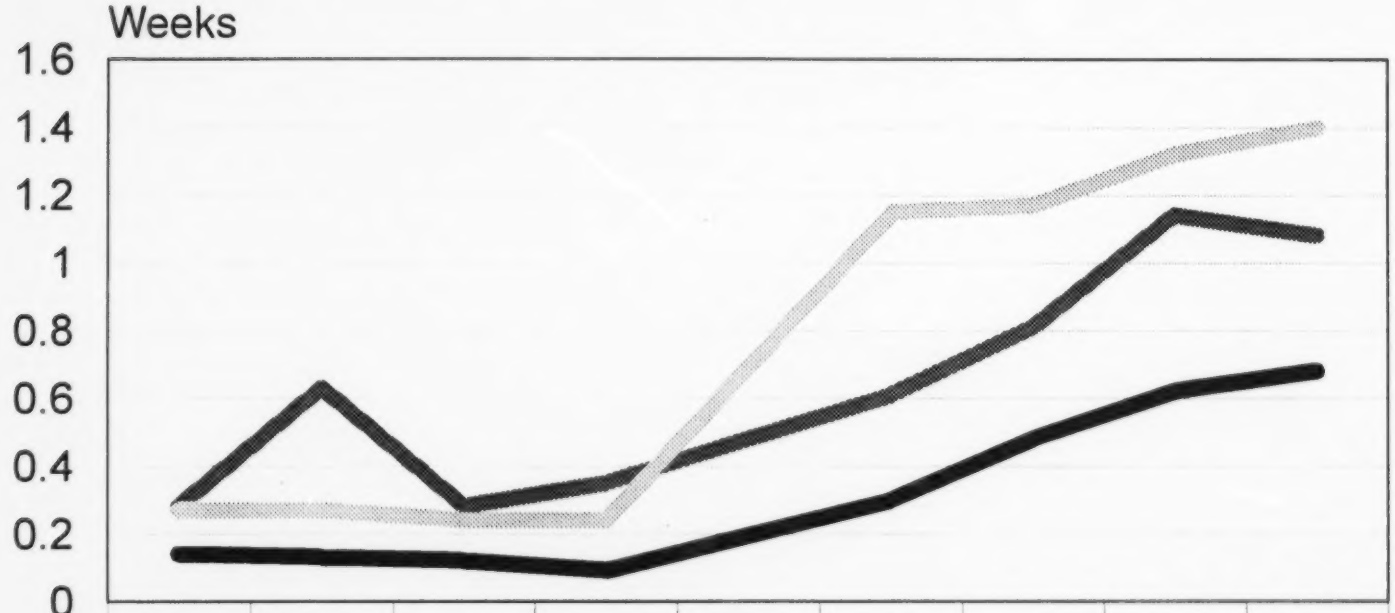
New Hires show a dramatically different pattern as displayed in Figure 16. Both New Hire Completers and Dropouts have a higher average number of employers than Controls in the year before training, although Dropouts remain substantially higher than Completers until the quarter before training. This may indicate that many New Hires lacked stable employment in the year prior to training and were patching together two part-time jobs to earn a living. In the quarter after training the average number of employers increased rapidly for Dropouts and declined rapidly for Completers, who fell to the level of the Control group. This pattern indicates that after failing to complete training, an increased number of Dropouts are forced to work multiple part-time jobs while many Completers now have a single employer offering full-time work. These data indicate to us that for New Hires, completing training leads to significant increases in steady full-time employment.

Figure 12
Average Annual Weeks of Unemployment
New Hires and Retrainees 1991-92



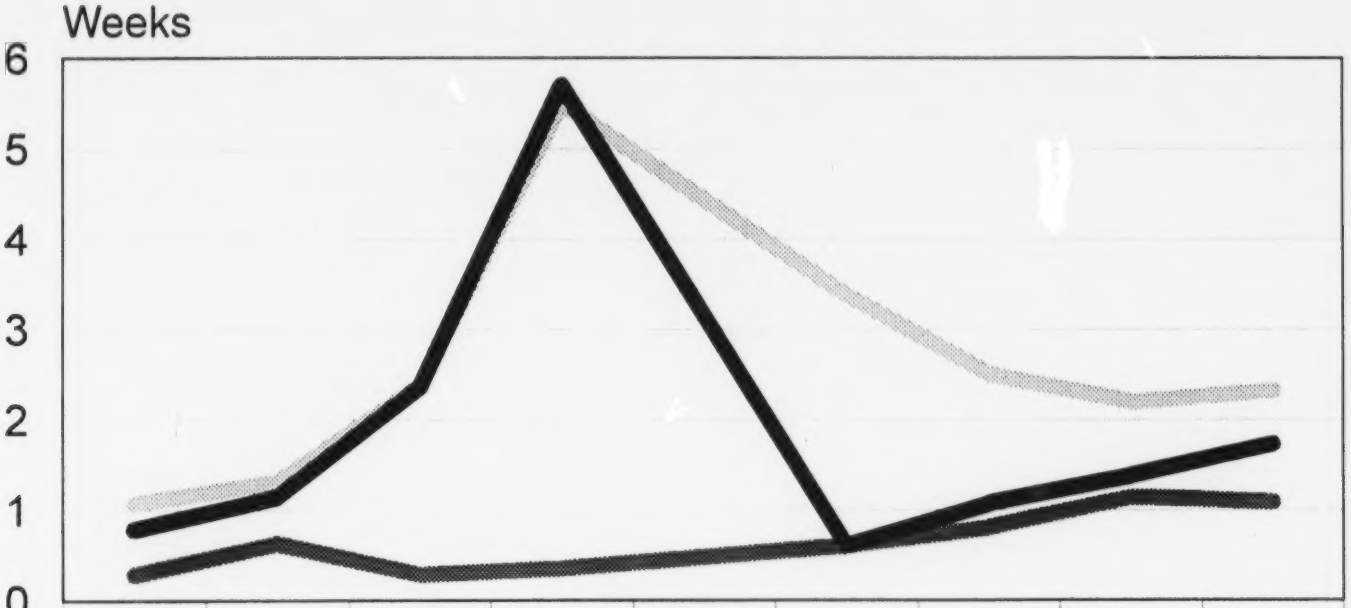
	Ret. Comp.	Ret. Drop	N Hire Comp.	N Hire Drop	Control
Pre-Training	0.5	1	10	10.3	1.16
Post-Training	2.1	5	4.8	10.4	3.6

Figure 13
Average UI Weeks By Quarter
1991-92 Retrainee



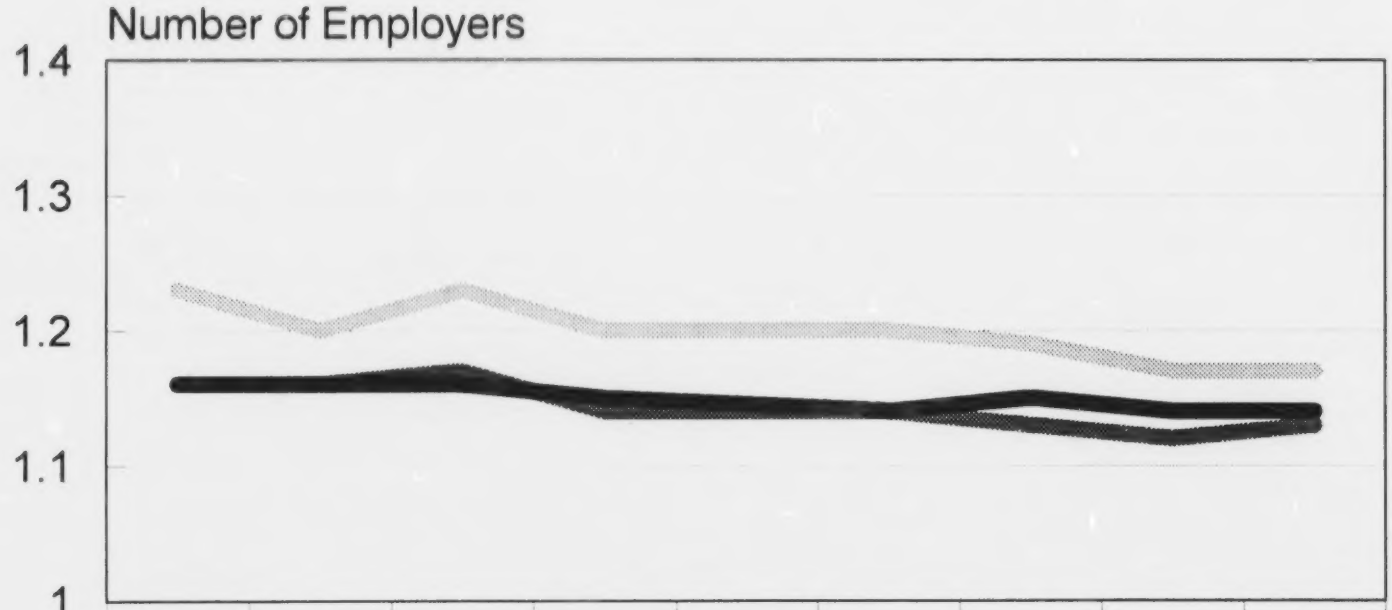
	-4	-3	-2	-1	Training	1	2	3	4
Completers	0.14	0.13	0.12	0.09		0.3	0.48	0.62	0.68
Drops	0.27	0.27	0.24	0.24	.	1.15	1.17	1.32	1.4
Control Group	0.28	0.63	0.28	0.35		0.61	0.81	1.14	1.08

Figure 14
Average UI Weeks By Quarter
1991-92 New Hire



	-4	-3	-2	-1	Training	1	2	3	4
Completers	0.78	1.14	2.35	5.7	.	0.6	1.07	1.38	1.73
Drops	1.07	1.31	2.37	5.5	.	3.38	2.5	2.19	2.32
Control Group	0.28	0.63	0.28	0.35		0.61	0.81	1.14	1.08

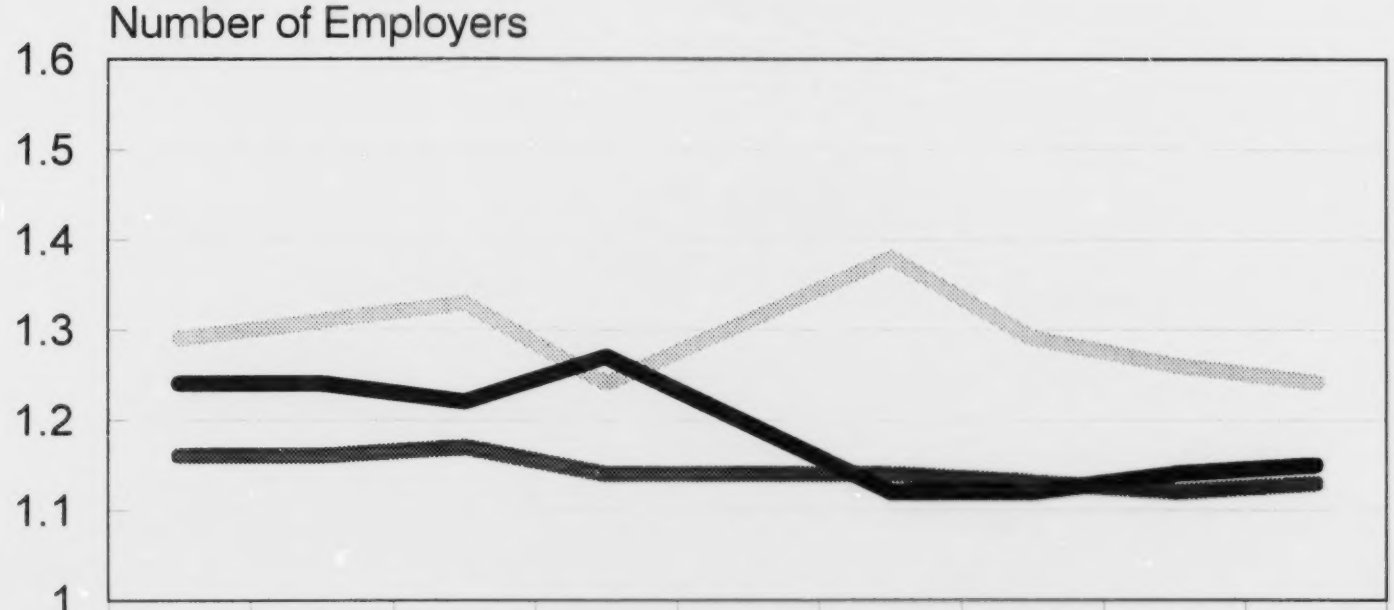
Figure 15
Average Number of Employers By Quarter*
1991-92 Retrainee



	-4	-3	-2	-1	Training	1	2	3	4
Completers	1.16	1.16	1.16	1.15	.	1.14	1.15	1.14	1.14
Drops	1.23	1.2	1.23	1.2	.	1.2	1.19	1.17	1.17
Control Group	1.16	1.16	1.17	1.14		1.14	1.13	1.12	1.13

*Average includes only trainees with an employer in the quarter reported.

Figure 16
Average Number of Employers By Quarter
1991-92 New Hire



	-4	-3	-2	-1	Training	1	2	3	4
Completers	1.24	1.24	1.22	1.27	.	1.12	1.12	1.14	1.15
Drops	1.29	1.31	1.33	1.24	.	1.38	1.29	1.26	1.24
Control Group	1.16	1.16	1.17	1.14		1.14	1.13	1.12	1.13

Regression Model Results: 1991-92 Trainees

Overview

The earlier analysis showed that Completers of ETP training earned significantly more than Dropouts. A question remains, however: was this difference in earnings due to the ETP training, or was it due to systematic differences in the characteristics of Completers and Dropouts and the programs that served them? Perhaps Completers were more highly educated than Dropouts, or maybe completers worked in industries with higher wages.

Multiple-regression analysis provides a tool for measuring the unique relationship between changes in earnings and completing ETP training, while controlling for differences in demographic and project characteristics. The multiple-regression analysis presented here has two objectives:

- to identify the unique impact of completing training on changes in earnings;
- to identify the unique relationship of demographic and program variables on changes in earnings.

The variables examined in this analysis are listed in Table 2. The "age/experience" variable is the only one that requires explanation. Age/experience is intended to represent both the approximate time that the trainee has spent in the labor force as well as his or her age. This variable is defined by the individual's age at the time of training minus 20 years. By defining the age variable in this manner, more weight is given to the variation in years when the trainee is of labor force age than the earlier years. The emphasis on years in the labor force is consistent with the many labor force studies which associate productivity with both the age of the labor force participant as well as his or her experience on the job.

The overriding conclusion of the regression analysis is that completing training, by itself, has a large and highly significant impact on the change in real earnings for both Retrainees and New Hires that cannot be attributed to other differences between the Completers and the Dropouts. In addition to confirming the impact of completing training on the change in real earnings, the regression analysis identifies other characteristics or conditions that also significantly influence the change in real earnings. Before identifying the magnitude of completion effect and discussing the impact of other variables on earnings, the regression methodology and the measures of statistical significance are discussed.

Table 2
Variables Included In Multiple-Regression Analysis

Completion of Training

Demographic Variables:
- age/experience
- gender
- marital status
- education level
- military service (veteran)
- ethnic group
- disabled
- GAIN participant

Program Variables:
- industry for which they are trained
- size of organization in which they were trained

Regression Method

The specific variable which the regression model attempts to predict is the change in real earnings expressed in 1990 dollars. Recall that this variable is adjusted to eliminate any effects of inflation on earnings. Real earnings are obtained by dividing the reported earnings by the Consumer Price Index for California wage earners, which is adjusted to a 1990 base. The change in real earnings is defined as the real earnings in the post-program year minus the real earnings of the pre-program year.

The change in real earning was regressed on the variables listed in Table 2 to isolate the direction and magnitude of each variable's influence on the change in real earnings. Two separate regression analyses were run, one for the Retrainees and one for the New Hires. This allowed for the possibility that some of the variables above would affect the group of Retrainees differently than they affected the New Hire trainees, which was the case in several instances.

The analysis produced three key statistical measures which are reported here. First, the adjusted R^2 statistic indicates the percent of the total variation in the change in real earnings which is "explained" by the variables in the model. This statistic measures the explanatory power of the model, which is the extent to which the total observed variation in the dependent variable (change in real earnings) is correlated with variations in the independent variables (those identified in Table 2).

Next is a regression coefficient, expressed in dollars. This statistic indicates the unique contribution of each unit of the independent variable to changes in real earnings. This measure may be positive or negative. Thus, a coefficient of -$174 for age/experience (in the Retrainee analysis) indicates that for every year older a person is, his or her change in earnings would be $174 less than for a one-year younger trainee with otherwise similar characteristics.

Finally, in parentheses under the regression coefficient is the standard error of the coefficient. This number, also in dollars, is used to generate statistical confidence intervals around the estimated coefficient. In a normal distribution, two-thirds of the observations fall within one standard error of the coefficient, 95% within two standard errors, and 99% within three standard errors of the estimated coefficient. These probabilities are used to generate "confidence intervals" around the estimated coefficient. For example, in the case of the age/experience variable for the Retrainees, the confidence interval indicates that the estimated impact of age fell within one standard error ($9) of the estimated coefficient in two-thirds of the cases. That is, in two-thirds of the Retrainee cases, the estimated impact of age fell between -$165 and -$183. A confidence interval containing 95% of the cases would extend two standard errors above and below the estimated coefficient, or the interval from -$156 to -$192 would capture the age effect for 95% of the Retrainee cases.

We indicated the statistical significance of each coefficient in the estimated relationships with a series of asterisks. Statistical significance indicates the probability that the estimated regression coefficient is not equal to zero. Specifically, the regression analysis uses the estimated coefficient, the standard error, and the "confidence intervals" to calculate levels of probability. The probability indicates the likelihood that the "true coefficient" lies within a specific confidence interval around the estimated coefficient. If that confidence interval does not contain zero, then the coefficient is said to be significantly different from zero at the level of probability indicated. Most studies use a five and/or a one percent confidence interval, indicating there is a one or five in 100 chances that zero is contained in the confidence interval.

Table 3 contains the results of the regression analysis for both Retrainees and New Hires. The coefficients marked with an asterisk are statistically significant, with the probability of 95 percent or greater that the coefficient is not equal to zero. It is especially important to note that the coefficients without asterisks can be considered to be zero, regardless of the numerical value listed. The absence of an asterisk indicates that the identified variable has no statistically significant relationship with the real change in earnings.

Regression Results: Power of the Analysis

Table 3 reports the estimated coefficients for the regression analysis (with the standard errors of the estimates in parentheses below). The number of observations (N) and the adjusted R^2 (the observed variation explained by the analysis) are shown for the Retrainees and the New Hires.

As Table 3 indicates, the Retrainee model explained about 8.5% of the variance in the change in real earnings while the New Hire analysis explained 13.3% of the variance. Both these estimated relationships are highly statistically significant and there is less than a 1-in-10,000 probability that the statistical relationships are due to chance. The percent of variation explained for the Retrainee equation is within the range of similar studies, (see for example Grubb (1991)), and the New Hire regression has a higher explained variation (adjusted R^2) than most similar studies. The unexplained portion of the variance may be related to : 1) factors not measured by this study, such as the personality characteristics of participants or the type of trainer; or 2) factors measured by the study for which the measurements are not adequately refined, such as the five categories of education or the four categories of business size; or 3) there may be simply random variation in the dependent variable. Additional data would have probably added to the explanatory power of this analysis. For example, a more refined classification of the industry in which training occurred or the occupational classification for which the people were trained might have increased the explanatory power. Training results may vary systematically by the type of trainer or by other parameters that were not measured. The amount of variation explained also would have been higher if complete data were available for all trainees.

The fact that the New Hire relationship had a somewhat higher explained variation than the one for the Retrainees is consistent with the previous regression analysis of the ETP trainees, and is probably due to the more homogeneous experience of the New Hires. The New Hires were all unemployed at the initiation of training and self-selected to participate, whereas the Retrainees were all currently employed but in a variety of industries and occupations and were selected by their employer to participate.

The case for the New Hires having a more homogeneous experience in ETP training programs is also reflected in the results of the regression analyses of the two groups. The fact that the regression analysis for Retrainees had more independent variables that significantly influenced the change in real earnings is further evidence of the more homogeneous experience of the New Hires. That is, the amount of the change in real earnings experienced by the Retrainees depended much more on the demographic characteristics and programmatic variables than it did for the New Hires, who experienced a more uniform change in real earnings. The greater number of statistically significant

variables for Retrainees occurred mainly with the educational attainment, the industry of employment, and the business size variables.

Bear in mind, though, that the lower explained variation of the Retrainee model in no way detracts from the significant influence that the examined variables had on the change in real earnings. However, the fact that there over 91% of the variation in the change in real earnings was not explained by the significant coefficients in the Retrainees model and over 86% in the New Hire model similarly was not explained by the regression model means that this analysis serves the relatively narrow purpose of ensuring that the completion of training, by itself, is a significant contributor to the change in real earnings. That is, the regression models show that the completion of training had a statistically significant contribution to the change in earnings completely independent of any other identified characteristic of the trainees or the training program that might have been correlated with completing the training.

Impact of Training and Completion

The key question this analysis addresses is, what was the impact of completing ETP training on changes in earnings? The regression analysis indicates that completing ETP training has a large, positive, and highly significant impact on the earnings of Retrainees and New Hires. The value of completing training for Retrainees, independent of all other variables, was $4,910 of increased real earnings. For New Hires the effect of completing training was $6,038. In both cases, the coefficient is highly significant with narrow confidence intervals, indicating that these increased real earnings are not due to chance. These effects of the completion of training for the Retrainees and the New Hires are also in line with the above reported difference between the change in real earnings for the Completers and the Dropouts in both groups. The difference in the change in earnings for the Retrainee Completers versus the Dropouts was $2,900 and the difference for the New Hire Completers versus the Dropouts was $4,900.

Regression Results: Demographic Variables

The analysis in Table 3 shows significant effects of age/experience, educational attainment, ethnicity, and military service on the change in real earnings for Retrainees, while only age/experience, gender, and military service impacted the New Hires. Marital status, participating in the GAIN program, or being disabled had no statistically significant effects on the change in earnings for either Retrainees or New Hires.

The Retrainees received an estimated $174 less in their change in real earning for each year more in their age and experience in the labor force. New Hires received $127 lower change in earnings for each additional year of age and experience that they have. This indicates that ETP training enhances productivity more for younger and less experienced workers than it does for older and more experienced workers. This is a reasonable result because the older and more experienced workers have also had more opportunities to learn or discover productivity-enhancing techniques and methods on the job or elsewhere. A formal training program delivered to both young/inexperienced and older/experienced worker would be expected to benefit the less experienced workers more and, in the case of ETP Retrainees and New Hires, it does.

The gender of the trainee was associated with different effects for the Retrainees and the New Hires. Female Retrainees seemed to experience a $400 greater change in earnings (at the 5% confidence level) relative to male Retrainees, while female New Hires experienced an increase in earnings of about $1,000 less than males (at the 1% confidence level).

Veteran status also had opposite effects for the Retrainees and New Hires. Among Retrainees, being a veteran was associated with about $1,000 less change in earnings relative to nonveterans, while New Hire veterans experienced about a $1,200 greater increase in earnings than New Hire nonveterans.

Education significantly affected earnings in only one case, and that was among Retrainees with low educational achievement. Retrainees with less than a high school education tended to experience about $1,200 less increase in earnings than did Retrainees with higher levels of education. No other educational levels were associated with significantly greater or less change in earnings for either the Retrainees or the New Hires. These results are consistent with those of the earlier ETP studies but not as dramatic. This year, as in the past, higher levels of educational achievement were associated with a greater change in earnings for the trainees.

There was only one significant relationship between the change in real earnings and ethnic identity for either Retrainees or New Hires. Among the Retrainees, the American Indians experienced a $3,300 lower increase in real earnings among Retrainees than did any other ethnic category. The total population of American Indians among all Retrainees was only 121, which means that this coefficient may well be associated with the outcomes of a particular training project or two, and may not reflect any consistent association with ethnic identity. The number of American Indians among the New Hires was only 12, and did not constitute a large enough group to be associated with any statistical trend.

Table 3
Regression Models For Predicting Change In Adjusted Annual Earnings
Retrainees (N = 16,249) and New Hires (N = 2,730)

Variable	Retrainee Coefficient (Standard Error)	New Hire Coefficient (Standard Error)
Intercept	-$2,393*	-$2,354
	(1,005)	(1,587)
Complete Training	4,910****	6,038****
	(221)	(352)
Age/Experience	-174****	-127****
	(9)	(18)
Gender (Female)	396*	-1,066**
	(198)	(420)
Marital Status (Married)	-223	-276
	(187)	(371)
GAIN	788	4,849
	(1,458)	(2,693)
Disabled	-2,067	341
	(1,181)	(1,542)
Education		
< H.S.	-1,190*	-368
	(617)	(1,065)
H.S. Grad	-415	106
	(396)	(958)
Some Coll.	-717	-501
	(408)	(1015)
Coll. Grad.	-649	-822
	(445)	(1,307)
Post Bacc.	734	2,707
	(542)	1,798

Table 3 (Continued)

Variable	Retrainee Coefficient (Standard Error)	New Hire Coefficient (Standard Error)
Ethnicity		
White	-480 (499)	-201 (139)
Black	-611 (608)	743 (1,453)
Hispanic	-723 (529)	902 (1,376)
Indian	-3,261*** (1,138)	-862 (2,903)
Asian	-138 (554)	249 (1,501)
Other	-1,371 (754)	1,872 (1,819)
Veteran	-1,040**** (279)	1,173* (583)
Program Characteristics		
Industry		
Agriculture	688 (773)	(base)
Construction	-345 (593)	N. A.
Manufacturing	(base)	N. A.
Transportation, Utilities	N. A.	-2280 (1,675)

Table 3 (Continued)

Variable	Retrainee Coefficient (Standard Error)	New Hire Coefficient (Standard Error)
Wholesale/Retail	-2,084**** (295)	N. A.
Finance, Insurance Real Estate	-1,424**** (302)	N. A.
Services	1,551** (486)	698 (1,519)
Food Production	1,597*** (489)	1,361 (1,674)
Business Size		
<50	466 (1,205)	N. A.
51-100	668 (1,141)	N. A.
101-250	1,844* (815)	N. A.
>250	678 (780)	-33 (713)
Consortia Training with Small Business Emphasis	1635** (567)	-1670**** (437)
Explained Variation (Full Equation)	**Adjusted R2=.085**	**Adjusted R2 = .133**

* = Significant at .05
** = Significant at .01
*** = Significant at .001
**** =Significant at .0001

Retrainee Regression Results: Program Variables

The change in real earnings for Retrainees varied considerably by industry, in contrast to that of New Hires. The manufacturing industry was used as the base industry for Retrainees, while agriculture was the base for the New Hires, due to insufficient numbers placed in manufacturing. Using one industry as a "base" means that the coefficients associated with the other industries reveal whether the change in earnings is significantly greater or less than that of the "base" industry. For the 1991-92 cohort, the New Hires did not vary in any statistically significant way with the industry of training or placement.

Among Retrainees, workers trained or placed in wholesale or retail trade and in finance, insurance, and real estate experienced significantly less increase in earnings relative to those in manufacturing (the base industry). For those in wholesale and retail trade, the change in real earnings was about $2,000 less; and those in finance, insurance, and real estate experienced about $1,400 less than the earnings change associated with Retrainees in manufacturing. On the other hand, both Retrainees placed in services and in food processing experienced about a $1,500 greater change in real earnings than did those in manufacturing.

Business size was not associated with higher or lower increases in earnings except in one case--that of consortia-based training that emphasized placement in small businesses. Consortia-based training is training that is not associated with a particular business in which the trainees subsequently work but is contracted by an association, a union, or even a community college and the trainees are then placed in various businesses. In the case of consortia-based training, though, the results were mixed for the Retrainees and the New Hires. Retrainees who were trained under these auspices tended to experience about a $1,600 greater increase in earnings than those trained by specific businesses, but New Hires trained in consortia-based units tended to experience about a $1,700 lower change in real earnings than did other New Hire trainees.

Economic Impact of 1991-92 Trainees on the California Economy

The impact of ETP training on the California economy is the difference between what did occur in the California economy with ETP training programs in place and what would have occurred in their absence. The estimates of ETP's impact range from nearly $50 million to over $200 million in the first year after training, depending on the effects taken into account and the assumptions used.

Our analysis of ETP's economic impact has two steps. First, we analyze the economic dynamics of ETP training to identify the components through which ETP training programs can affect economic activity. Next, we estimate the impact of ETP training on each of the components, and then aggregate the component effects to get the overall impact of ETP on the state's economy.

The Economic Components

The economic impact of ETP training has four components.

Component 1:	Unemployment Insurance savings
Component 2:	Increased productivity of trainees (measured by earnings)
Component 3:	Multiplier effects of increased productivity
Component 4:	Value of jobs saved

We estimate the economic impact of ETP training on the California economy for the first year after training using these four components In the following section, we explain how ETP training affects each component and how we arrived at our estimate of the impact. We also estimate the longer term impact of ETP on worker productivity.

Component 1: Unemployment Insurance Savings

One goal of ETP training is to reduce unemployment among participants and, as indicated above, ETP does reduce unemployment among both New Hires and Retrainees. An outgrowth of reducing unemployment is that ETP saves the state money by reducing Unemployment Insurance (UI) claims that would otherwise be paid to unemployed workers. The New Hires are unemployed at the time of training and presumably their unemployment would continue for some period of time if they were not trained and placed by an ETP program. Retrainee Completers also have lower post-training unemployment than do Retrainee Dropouts. In addition, the Retrainees may also be saved from suffering substantial unemployment by ETP retraining, since ETP requires that Retrainees be in jeopardy of losing their jobs. Presumably, ETP training saves the Retrainees from this near certain unemployment and therefore lowers Unemployment Insurance outlays.

Figure 17
First Year Impact of ETP Training
Conceptual Model

		Component 1:		Component 2:		Component 3:		Component 4:
State-wide Economic Impact	=	UI Cost Savings	+	Productivity Increase (Earnings Change)	+	Multiplier Effect of Increased Productivity	+	Value of Jobs Saved

We have developed two estimates of the UI savings attributable to training--one based on a comparison of the Completers with the Controls and the other based on a comparison of the Completers with the Dropouts. Our first measure of the impact of ETP training on Unemployment Insurance claims is the difference between the post-program UI claims of Completers and the post-program claims of the Control group. The assumption here is that without ETP training (which includes placement), Completers would experience the same level of UI claims as the Control group. The actual measure of UI payments that we used for the Control group was the percentage of post-training period earnings that the Control group claimed as UI payments. The Control group claimed 1.76% of their post-training earnings as UI payments. We then applied this same percentage to the Retrainee completers and the New Hire Completers and calculated the difference between what they actually drew in UI payments and what they would have drawn had their UI payments been 1.76% of their post-training earnings. Since they actually drew less on the whole than 1.76% of their earnings, the difference of $2,385,000 is our first estimate of UI savings due to ETP training (as shown in Table 4 in the first column under "compared to Controls").

Note that this "control-based"estimate of savings is composed of estimated UI payment savings of $2,870,000 for the Retrainees and -$485,000 for the New Hires. The New Hires estimated savings is negative because they actually claimed 3.65% of their post-training earnings as UI payments which is above the 1.76% claimed by the controls. However, the New Hire Completers decreased their percentage of earnings claimed as UI payments from 8.57% in the pre-training period to 3.65% in the post period, while the Controls experienced an increase in their percentage of earnings claimed as UI payments, rising from 0.41% to 1.76%. One could argue in this case that the Control experience in the post-training period did not really represent the expected experience of the New Hires, since the New Hires were all unemployed in the quarter prior to the training period while 92% of the members of the Control group were employed during that quarter. This line of reasoning suggests that the New Hire Dropouts may constitute a better comparison group for the New Hire Completers, since both groups were unemployed prior to training and the difference between the two groups is that the Completers finished training while the Dropouts did not. If ETP training did not exist, then the Completers would not have completed training either, so the experience of the New Hire Dropouts really represent the expected experience of the New Hire Completers without access to ETP training. A similar argument can be made for the Retrainees, namely that the post-training experience of the Dropouts represents the expected post-training experience of the Completers. This argument notes that all of the Retrainees jobs are in jeopardy in the period prior to training as an eligibility condition for ETP funding. However, most of the jobs of Control group members are not in jeopardy in the same period. Again, the Retrainee Completers and Dropouts are similar in that both have jobs that are in jeopardy and the apparent difference between the Completers and Dropouts is that the one group completes ETP training while the other does not.

Our second estimate of the UI savings due to ETP training is based on these arguments which suggest that another legitimate estimate of the UI savings is based on the difference between the post-training experience of the Completers versus that of the Dropouts. The second estimate of UI savings in the first column of Table 4, entitled "compared to drops" used the post-training experience of training Dropouts to define the expected post-training experience of Completers if ETP did not exist. The New Hire Dropouts had 13.68% of post-training earnings in UI payments while the Retrainee Dropouts had post-training UI payments equal to 3.25% of their earnings. Applying these percentages of post-training earnings to New Hire and Retrainee Completers yields $2,570,000 and $9,065,000 respectively in UI savings. Our "Dropout-based" estimate of UI savings due to ETP training totals $11,635,000 for both groups.

This second estimate of UI savings gains credibility as an appropriate estimate based on the experience of members of the Control group who were unemployed sometime during the post-training period. For those workers in the Control group who experienced unemployment in this period, the annual average weeks of UI claimed was 15.6 weeks. The average period of unemployment for the New Hire and the Retrainee Dropouts who experienced unemployment during the same period was 15.7 weeks and 15.75 week respectively. Thus the average period of unemployment experienced by unemployed members of the Control group was essentially equal to the period of unemployment experienced by the New Hire and Retrainee Dropouts. This equality of weeks of UI claimed by unemployed members of the Control group, New Hire Dropouts, and Retrainee Dropouts implies that the post-training experience of the Dropouts is a good proxy for the expected post-training experience of the Completers if ETP did not exist. For this reason, we show only the "Dropout-based" $11,635,000 estimate of UI savings in the last row of the first column of Table 4 for Scenario 3. In this Scenario we estimate the UI savings based on the assumption that a number of the New Hire and Retrainee Completers lose their jobs because the ETP training programs do not exist. The estimate of $11,635,000 in UI savings specifically assumes that the New Hire and Retrainee Completers stay unemployed for the same amount of time in the post-training period as the Dropouts did.

Component 2: Productivity Increase

The productivity of ETP trainees may increase either because they produce more per hour worked or because they work more hours in a year. Any training program that increases the marketable skills of the participants creates additional economic capacity to produce. ETP programs may have an advantage over other training programs, though, because of the placement requirement in ETP contracts. Other training programs create the potential to produce more; that potential is realized when the newly trained workers are placed. ETP contracts require placement as a condition of training, so when ETP training is completed the economic potential of the enhanced productivity is realized. Thus, the impact of ETP training is realized immediately in increased output for the

California economy, due to the enhanced productivity of the trainees who complete the program. In addition, because trainees are now more skilled, they may have the opportunity to work more hours by avoiding periods of unemployment associated with less marketable skills.

Unfortunately, directly measuring an individual's change in productivity is difficult and expensive. Direct measurement of productivity requires accurate physical output and input data for the periods before and after training. Such data are generally not available, and ETP projects are no exception. Even if those data were available, direct measurement of individual productivity is complicated because newly trained workers typically work with different equipment, different materials, and differently skilled people than they did before training. It is difficult to separate a single worker's change in productivity from the contribution made by the new equipment, new materials, and differently skilled workers.

In this project, as in most studies, the change in earnings is used as an indicator of the change in worker productivity. Standard economic theory implies that workers are paid the value of their contribution to production (their marginal product). Accordingly, an increase in productivity should result in an increase in workers' earnings. The advantage of using earnings as an indicator of productivity is that earnings data are much more available than physical output data and earnings data are reported on an individual basis. Because records of the physical change in production levels do not exist for ETP projects, we used the changes in earnings data as an indicator of changes in productivity.[4]

The availability of Control group data improved and simplified the estimation of the economic impact of ETP training relative to previous studies. The estimates were improved because we did not have to restrict the analysis to the subpopulation of the trainees who were found in the California labor force both in the fourth quarter before training and in the fourth quarter after training and infer that this subpopulation's experience represented that of all training Completers. Instead we were able to compare the sum of earnings before the training period to the sum of earnings after the training period for all member of the Control group and all training Completers. The task was simplified because Control group data were used to determine what the experience of the New Hire and Retrainee Completers would have been in the post-training year without ETP training. The excess of earnings of New Hire and Retrainee earnings above the expected level was attributed to ETP training.

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[4]Some researchers argue that measuring the change in wages underestimates the increase in productivity because of the omission of commonly paid benefits (see for example Bishop, 1985). If this is correct, then these estimates understate the real impact of ETP training on worker productivity.

The real earnings of the Control group in the post-training year was 90.44% of their real earnings in the pre-training year. We applied this percentage to the pre-training earnings for the New Hire and Retrainee Completers to determine their expected post-training earnings. The New Hire Completers' post-training earnings exceed the expected level by $6,250,000 and the Retrainee Completers' post-training earnings exceeded the expected level by $38,420,000. The sum of the earnings of the New Hire and the Retrainee Completers above their expected levels is our estimate of the increased productivity of the trainees due to the ETP programs. The estimated increased productivity, a sum of $44,670,000, is reported in the second column of Table 4.

A comparison of the increased productivity of the 1991-92 training cohort with the earlier training cohorts is complicated by the different methodology used in this analysis. The current methodology yields an estimate for all trainees in a group relative to a benchmark experience of a control group. The methodology used in the past provided an increased productivity estimate per trainee based on before and after-training comparisons of the trainees found in both the fourth quarter before and in the fourth quarter after training, and then applying that difference in earnings to the total number of trainees in a category. As mentioned above, the current methodology is considered an improvement because it is based on the total earnings before and after training, and not on the earnings experience of a subgroup of the trainees. These different approaches may be expected to cause some variation in the estimated increased productivity. With that caution in mind, we proceed to compare the current cohort with the previous training cohorts.

The standard for comparing the estimated productivity increase of the 1991-92 cohort with the 1990-91 and 1989-90 cohorts is the average estimated productivity increase per Completer. For the current cohort, this estimate was derived by dividing the estimated increase in earnings due to ETP by the number of trainees in the group. This procedure yielded an estimated productivity increase of $3,750 per New Hire Completer and $2,670 per Retrainee Completer. The estimate for the Retrainees is in line with previous estimates for Retrainees--at $2670 for current trainees compared to $2,621 for the 1990-91 Retrainees and $1,615 for the 1989-90 Retrainees. However, the current increased productivity estimate of $3,750 for New Hires is about half of the previous estimates for this group--estimated at $8,389 for the 1990-91 New Hires, and at $7,399 for the 1989-90 New Hires. This large difference would seem to warrant some explanation.

There are several possible sources of the relatively large differences in the estimated training-enhanced productivity of the New Hires cohorts. One source of the difference may be explained by the differing methodology, in that the current methodology is more inclusive because it develops an average estimated increased earnings for everyone in the training group, rather than the subset of trainees who were found in both the labor force in the fourth quarter before and the fourth quarter after training. The more inclusive methodology may yield smaller average increases in productivity by

including people who did not participate in the labor force for the entire post-training year. Another possible source of this difference is in the nature or type of New Hire projects undertaken in 1991-92 versus the previous years. Projects in the 1991-92 period may have been in different industries or occupations where potential productivity gains were not as great, may have been of a different length or quality, or may have attracted a different quality of applicant than in the past. Another source of the difference could be the result of differences in the economic environment when the 1991-92 group finished training (a recession) versus the environment when the previous groups finished training. Finally, in each year the number of New Hire Completers has been small (between 1,000 and 2,000) relative to the number of Retrainee Completers (from 16,000 to over 30,000) and these smaller numbers introduce a greater chance that random variation in the outcomes will significantly affects the estimated average performance.

Further tracking of the New Hire training cohorts would seem to be in order to refine the estimated increase in productivity of the New Hire group due to ETP training, and to narrow the possible sources of the differences in the current estimates.

Component 3: Multiplier Effects Of Increased Productivity

ETP training programs have the potential to have an economic impact beyond the direct effects on the program participants and the firms in which they are employed. Whether this potential economic impact is realized depends on the nature of the training and the competitors of the firms in which they are placed. Specifically, the workers must be Retrainees and the firms must be in basic industries for the potential indirect economic impact to be realized. We define basic industries as those which must compete with out-of-state businesses. For example, a company that manufactures computers competes with companies out-of-state and in other countries and is thus in a basic industry. Conversely, a restaurant does not compete with other restaurants out of the state, but with other local restaurants and thus is not in a basic industry. The reasons for these assumptions are explained below.

The ETP retraining programs involve workers who are already employed by a firm but are in jeopardy of being laid off because this particular part of the firm's operation is becoming economically not viable. In other words, this part of the firm's operation is not "meeting its competition" and the firm will lose market share, have to cut production, and workers as a result. ETP retraining programs directly enhance the competitiveness of California businesses by increasing both the skills of the workers and the skill requirements of those workers' jobs. Businesses that have ETP retraining programs thus may be expected to preserve or to expand their market share relative to what would have happened without the ETP program. In this way the layoff jeopardy of the workers is reduced.

Because ETP retraining programs upgrade both the workers' skills and their jobs, these ETP programs strengthen the competitive advantage of California businesses relative to their competitors. The enhancement of a firm's competitive advantage produces an economic impact beyond the direct effects of ETP on the businesses and the workers. To the extent that ETP retraining programs strengthen the competitive advantage of California businesses relative to their out-of-state competitors, this means increased sales for these California businesses and increased sales and jobs for their in-state suppliers. The impact of the retraining programs on the California economy would be the increased production in the businesses with the retraining programs, plus the increased activity of their various suppliers. The aggregate of the increased production of their suppliers is the "indirect effect" of the direct impact on the businesses with retraining programs. This indirect economic impact is called a "ripple or multiplier effect" and it requires that there be no offsetting negative effect on other California suppliers. California's economic environment and the conditions which lead to multiplier effects in the California economy are described below.

California has the largest economy of any state in the nation and is a major trade center for the Pacific Rim. Recent advances in communications and information processing technologies, along with falling transportation costs, have produced keen competition in the markets for nationally and internationally traded commodities and services. Consequently, California businesses that produce, warehouse, transport or sell nationally and internationally traded goods and services face rigorous domestic and international competition.

Whether a particular retraining program has a multiplier effect in the California economy depends critically on the location of the competitors of that business. If that firm's competitors are located out-of-state, then the increased activity of this business and its suppliers comes at the expense of out-of-state firms and suppliers. This would produce a net gain in production and jobs for California. However, if a firm's competitors are other California businesses, then this firm's gains and its suppliers' gains come at the expense of other California businesses, and produce essentially no net gain for the California economy.

In standard economic theory, regional multipliers are derived from the distinction between "basic" activities and "service sector" activities. The businesses that operate in these competitive national and international markets are the "economic base" of the region's economy. According to the regional theory, these "basic" activities generate the jobs in the "service sector" of the local economy through orders from their local suppliers and through payroll expenditures that generate local household demands. The "services sector" includes all the businesses that are suppliers to locally-situated industry and households, or, put another way, businesses which respond to locally-generated demand for goods and services. Regional theory postulates that variations in the output of the basic

industries spawn variations in their local orders and their payroll, which in turn cause variation in the demand for the service sector products. Regional multipliers show the relationship between a change in the output of a basic industry and the output of a region as a whole (basic plus service sector). Basic industries that have a greater proportion of local suppliers and high local payrolls relative to output have larger multipliers. Basic industries that have weaker linkages to the local economy have smaller multipliers.

The service sector is typically identified with local suppliers of large firms, retail trade, local business services, most personal services, and local government activities. In contrast, businesses that supply demands generated outside the local economy are part of the economic base. The economic base encompasses all export-oriented activity and includes: the portion of local hotels, restaurants, entertainment and retail trade that services visitors; governmental activities funded by non-local sources; and interregional financial, insurance, transportation, and utility networks.[5]

The simple classification of the firm's industry as either basic or service sector usually determines whether a particular training program will have multiplier effects. However, there are some cases in which retraining programs in the service sector could also have multiplier effects. This would occur in the case where a firm's market consists of local customers but the firm competes with out-of-state producers who also supply this local market. This is the case of "import substitution," when an increase in the firm's output takes place at the expense of imported goods instead of locally-produced goods. If new local production replaces consumer or production goods and services that would have otherwise been imported from outside the region, then this new locally-oriented production generates additional local jobs. In short, this import-substitution type of service activity can have multiplier effects. If all of the service sector training done by ETP were in businesses which competed with non-California suppliers, then the productivity enhancement in those industries would also be subject to a multiplier effect on local jobs.[6] The multiplier effect accounts for the new economic activity created in the service sector as local suppliers respond to the higher demands from the firm and the community. This analysis suggests that ETP could be most effective in fostering economic growth in California by concentrating its retraining programs in firms in the basic sector or involved with import substitution. Retraining in these industries would increase output both directly (the productivity effect) and indirectly (the multiplier effect). For example, if all of the retraining programs in 1990-91 had been directed at workers in these types of

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[5]Basic industries in the California economy have been researched and identified by the Center for the Continuing Study of the California Economy (CCSCE) in Palo Alto.

[6]The industry codes listed for the ETP projects studied here are not sufficiently refined to clearly identify whether the industry is export oriented or locally oriented.

firms, the indirect impact on California production would have been over $25 million higher in the first year alone.[7]

Note that training among the Retrainees is likely to generate these multiplier effects but training among the New Hires is not. Retrainee programs involve an upgrading of the job as well as the workers' skills. By upgrading jobs, businesses gain a competitive edge in the market and therefore will order more goods and services from their suppliers. An additional effect occurs as the Retrainees become more productive, earn more, and thus spend more in the local economy, generating additional economic activity.

In contrast, ETP trains New Hires because these people are currently unemployed and require training to qualify for a job that is already available. An important feature of new hire training is the presumption that the job is available, and that if the New Hire trainee did not fill the job, someone else would. Thus, the consistent assumption for the New Hire trainee is that the training increases the productivity of the newly-trained worker, but does not increase the level of production in the host firm. This assumption -- that no new or more productive jobs are created in training New Hires -- limits the benefits of New Hire training to the increase in productivity experienced by the worker. That is, the benefit of New Hire training is only the increased productivity of the work force and the productivity of California businesses is not enhanced through New Hire training. This assumption is conservative but it is justified by the nature of most of the New Hire training projects. This conservative assumption is maintained throughout the series of estimates. Multiplier effects are assumed only for the retraining programs where job upgrades are present.

The multipliers used in this study were developed from the IMPLAN system specifically for this impact analysis. The IMPLAN system can generate output, income, and employment multipliers, among others. A more complete description of the IMPLAN multipliers appears in Appendix B, along with the multiplier values for the various industries. We used the set of output multipliers for California's basic industries, which averaged about 1.9. This multiplier value[8] indicates that for each dollar of new activity in the basic sector, 9/10 of an additional dollar of activity is created in the service sector.

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[7]The estimated increase in California production is $25,822,500, and is based on the .9 multiplier effect being applied to the 37% of Retrainees who were not in basic industries in the 1990-91 period.

[8]Different multiplier values are associated with different basic industries; these values commonly range from 1.5 to 2.5. Unfortunately, the training project records are not sufficiently detailed to allow for consistent distinction between the multipliers in different retraining projects.

It is common to apply the multipliers to changes in basic activity to determine the effect of that change on total activity. We used a list of industries that have been determined to be basic industries in California, to determine the likely extent of retraining programs that are in basic industries or involved with import substitution. In cases where there was any doubt, we obtained the ETP contract information to determine the nature of the business and the competitors in its market. Our analysis of the ETP projects indicates that about 61.5 percent of the retraining occurred in firms with potential multiplier effects[9]. We therefore applied the multiplier of 1.9 to 61.5 percent of the increase in earnings generated by retraining to obtain this estimated multiplier effect on the economy. The additional benefits to the California economy from the indirect effects of the Retrainee's increased productivity are estimated at $21,265,000 as reported in Scenario 2 below.

Component 4: Value of Jobs Saved

In theory, since ETP "Retrainees" received training because their jobs covered by the project are in jeopardy, these people must have been in imminent danger of losing their jobs. The presumption here is that without upgrading the jobs and the workers' skills, these jobs in these particular firms would be eliminated. The ETP training upgrades the jobs and the workers' productivity sufficiently to enable the firm to maintain or enhance its competitive position.

Had the ETP program not existed, the retraining and job upgrading presumably would not have occurred. These jobs could have been lost to the California economy, at least temporarily. A temporary loss of these jobs to California could occur while the current companies restructure or, if those companies retrench, until other California businesses recognize the market opportunity and reestablish the lost jobs. The important variable in this component is the time period for which the jobs are lost.

If these jobs are saved, instead of temporarily lost, there are two components to the value of the savings. First, the potentially unemployed workers will not draw Unemployment Insurance for some period because they did not become unemployed. Second, the California economy will not lose the economic activity associated with those jobs for the period of time that they would have been lost. These are savings that would not occur in the absence of ETP, assuming the Retrainees' jobs would be lost. These savings therefore are a benefit of the ETP program that should be added to the economic impact of ETP.

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[9]See California Economic Growth, Center for Continuing Study of the California Economy, Palo Alto, Ca., 1991, pp. A1-A5, for the list of basic industries.

There are no data on the period of time it takes an eliminated job to be reestablished. The proxy variable used for that period of time is the average period of unemployment for California workers. These two variables ought to be very closely related, if not mirror images of one another, because people have to fill reestablished jobs in order for them to have an economic impact.

To estimate the value of saving Retrainee jobs from temporary loss to the California economy, we multiplied the estimate of how long workers in the control group are typically unemployed (15.6 weeks) times the average adjusted weekly earnings before training for Retrainees who completed. This calculation yielded an estimated value of jobs lost for Retrainees in the year after training of $124,760,000 as presented in Scenario 3.

It is worth noting that this analysis of temporary job loss is most applicable to retraining programs in firms in the local service sector as opposed to the basic sector. California jobs in the basic sector that are lost may well be reestablished in some out-of-state business, and therefore may be permanently lost to California. Lost basic sector jobs would have an even higher cost to California than estimated here because of the longer period of job loss and the multiplier effect on local service sector activity.

Estimating ETP's Statewide, First Year Economic Impact for 1991-92 Trainees

As we noted earlier, the overall first year economic impact of ETP can be thought of as the sum of the four components described above. The estimates for the four components vary depending on the assumptions that go into each component. To represent the unique contribution of each component, we created three scenarios for estimating ETP's overall impact. The assumptions that went into each scenario are described above; recall that the range of the estimates in Scenarios 1 and 2 derive from the alternative assumptions of whether the Control group or the Dropouts represent the expected post-training experience of the trainees had ETP not existed. The actual 1990 dollar estimates for each of the components of each scenario are presented in Table 4.

Scenario 1:
This scenario assumes the ETP's impact is limited to the immediate savings in UI payments, and the increased productivity of trainees. UI payments saved are estimated by multiplying the average difference between UI payments to Dropouts and Completers times the number of Completers. Productivity is simply measured by the actual increase in Completers' adjusted earnings.
First Year Impact: $ 47,055,000 to $56,305.000

Scenario 2:
This scenario retains the assumptions about UI savings and increased productivity. It then adds the 1.9 multiplier effect to the 61.5% of increased productivity for Retrainee Completers that takes place in basic industries.
First Year Impact: $68,320,000 to $77,570,000

Scenario 3:
This scenario adds the estimated value of potentially lost jobs of the Retrainee Completers to the UI savings, increased productivity, and multipliers effects. This scenario assumes that all Retrainees Completers' jobs would be saved from temporary loss, based on the three different estimates of unemployment.
Total Impact: $202,330,000

Table 4
Estimated First Year Impact of ETP Training on 1991-92 Trainees

Scenario	1st Year UI Savings	1st Year Increase In Productivity (Earnings)	Multiplier Effect on Increased Productivity - 1st Year	1st Year Value of Jobs Saved	Total First Year Impact on the California Economy
Scenario 1:					
New Hire Completers		$6,250,000			
Compared to Controls	$(-485,000)				
Compared to Drops	2,570,000				
Retrain Completers		38,420,000			
Compared to Controls	2,870,000				
Compared to Drops	9,065,000				
Total		44,670,000			
Compared to Controls	2,385,000				$47,055,000
Compared to Drops	11,635,000				56,305,000
Scenario 2:					
.9 Multiplier applied to		44,670,000	21,265 000		
61.5% of Retrainees in basic	2,385,000				68,320,000
industries.	11,635,000				77,570,000
Scenario 3:					
Value of jobs saved added.	11,635,000	44,670,000	21,265,000	124,760,000	202,330,000

Long-term Impact of ETP Training

ETP training continues to have an impact on the economy beyond the year immediately after training. The productivity increases experienced in the first year after training by those who complete training can be expected to last for some time into the future. These long-term productivity increases are also benefits of ETP and should be taken into account. To estimate the long-term benefits we must determine how long these productivity increases last and at what rate they depreciate, if they do depreciate.

We tracked the 1989-90 cohorts for a second and third year after training to provide some preliminary indication of the longevity of the productivity increases. To track the earnings of trainees we calculated two indexes of total earnings for the three years after training, one for the Completers and one for the Dropouts, with both based on the year before training (earnings in the year before training =100). We then calculated the percentage differential between these indexes over the three post-training years. The index differential stood at 11.4% in the first year after training, 9.2% in the second year, and 10.3% in the third year after training. The depreciation rate in the earnings differential was 9.6% over the two years, which implies an annual depreciation rate of only 4.8%. The depreciation rate was somewhat larger from the first to the second year, but variations in the actual rate of depreciation are to be expected. We regard this evidence of the depreciation rate of the earnings differential between the training Completers and the Dropouts as preliminary, and we note that this 4.8% rate is considerably below the 12 year straight-line depreciation rate (which yields an 8.25% annual rate) that we have used in previous ETP studies. Nonetheless, we will continue to use the higher 12 year depreciation rate in appraising the long-term effects of ETP, in part because it corresponds to the results disclosed in recent research conducted by the Rand Corporation (Lillard and Tan, 1986). They found that training continues to have an impact on productivity for about twelve years. We therefore assumed a straight-line depreciation rate of one-twelfth per year in the productivity increase associated with ETP training.

We estimated the long-term impact of ETP training by applying a straight-line depreciation method to the measured increases in productivity reported for the 1991-92 Retrainee Completers and New Hire Completers. That is, we assumed the impact of training will diminish 1/12 each year and disappear after the twelve year. We also adjusted these figures by discounting the resulting estimated future productivity changes to a 1991-92 base year which corresponds to the year after training. The appropriate discount rate was obtained by following the common practice of using a U.S. Treasury bond rate that corresponds to the period over which the benefits occur. Recent 12 year U.S. Treasury bond rates have been around 6.5 %. So we applied a discount factor of 6.5 % to the stream of productivity increase generated by the ETP programs studied.

Table 5 shows that applying this technique yields an additional impact on productivity of $190.0 million for years 2 to 12. When added to the year one impact of $44.7 million, the total value of the ETP-produced productivity is $234.7 million, evaluated in 1990 dollars in the year after training. This means that in the year after the 1991-92 ETP training programs were completed, the present value of the enhanced productivity produced by those programs was worth $234.7 million to the California economy. This figure is about half of our estimated $457.0 million in the long-term value of productivity increases for the 1990-91 cohorts reported last year. The reason that this number is about half of last year's estimated long-term productivity increase is that there were about half as many trainees in the 1991-92 period as there were the previous year.

This $234.7 million long-term estimate of the value of ETP contracts completed during 1991-92 ignores the multiplier effects that are associated with Retrainee programs where the firms compete with out-of-state businesses. Accounting for the multiplier effects would contribute another $111.8 million to $234.7 million for a total, long-term impact on the California economy of $346.5 million in present value and real dollar terms.

From a cost-benefit perspective, these are impressive results. The estimated $234.7 million gain in productivity for employed California workers in the 1991-92 cohort was obtained at a cost of about $35 million in UI-generated funds plus the additional costs of training that were borne by the firms and the trainees themselves. While this study does not attempt to estimate those additional costs, reasonable estimates would probably place these cost below the $35 million outlay in UI funds. Even if the additional costs were twice the $35 million outlay, the training would be a terrific deal for California and its labor force. ETP programs would be an investment in training that returned around $2.50 in present value terms for every dollar invested by everyone involved[10].

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[10]This rate of return considers only the narrowest estimate of the benefits of ETP training since it is based only on the productivity gains of the Completers. Taking into account the estimated ripple effect would add another $1 in return for every $1 invested, and taking into account UI saving and possible "lost job" saving would boost the return considerably.

Table 5
Estimated Long Term Impact of Productivity Changes From ETP Training 1991-92 Trainees In Present Value and Real Dollar Terms (6.5% Discount Rate, 1990 Dollars)

Year	Impact (In Millions)
1	$44.7
2	38.5
3	32.9
4	27.7
5	23.2
6	19.0
7	15.4
8	12.0
9	9.0
10	6.4
11	4.0
12	1.9
Total Years 2-12	$190.0
Total Years 1-12	$234.7

Results: 1990-91 Trainees Year 1 and Year 2 After Training

In this analysis we track trainees from projects that completed in 1990-91 to the second year after training. Once again we compare the experience of Retrainee and New Hire Completers and Dropouts with a Control group. Analysis of earning, UI payment and weeks of unemployment are limited to trainees and Controls who were present in the California labor market in the fourth quarter before training, the fourth quarter after training, and the eighth quarter after training.

Trainees By Industry

Figure 18 shows the distribution of trainees, both Retrainees and New Hires Completers and Dropouts combined, by industry group in which they worked their first quarter after training. The chart reveals that in 1990-91 ETP industry distribution was substantially different than in 1991-92. The single largest industry group was retail, a non-basic industry. There were a substantial number of trainees in various manufacturing areas particularly the manufacture of transportation equipment, which includes aerospace, as well as other manufacturing areas. ETP trainees were also represented disproportionately in banking and auto related services. ETP trainees were disproportionately under represented in construction, agriculture, forestry fishing and minerals, wholesale services, and other service areas.

Employment Stability

As In 1991-92 we found that 1990-91 ETP trainees who completed training had substantially more employment stability then Dropouts or workers in the Control group. A key measure of stability is whether or not trainees remained in the California labor market. This measure is important because as long as trainees remain within the California labor market their training may contribute to the state's economy. Figures 19 and 20 show the percent of trainees that were in the California workforce four quarters before training, four quarters after training, and eight quarters after training. As Figure 19 indicates, 82% of Retrainee Completers remained in the labor market four quarters after training and this fell to 76% eight quarters after training. Dropouts were much more likely to leave the California labor market, with only 69% of Dropouts found four quarters after training and 61% eight quarters after training. The pattern was similar for New Hires as depicted in Figure 20. Four quarters after training, 75% of New Hire Completers were still in labor market and this fell to 65% eight quarters after training. In contrast, only 62% of New Hire Dropouts were found four quarters after training, declining to 50% eight quarters after training.

Figure 18
Industry Distribution
All California Workers and 1990-91 Trainees

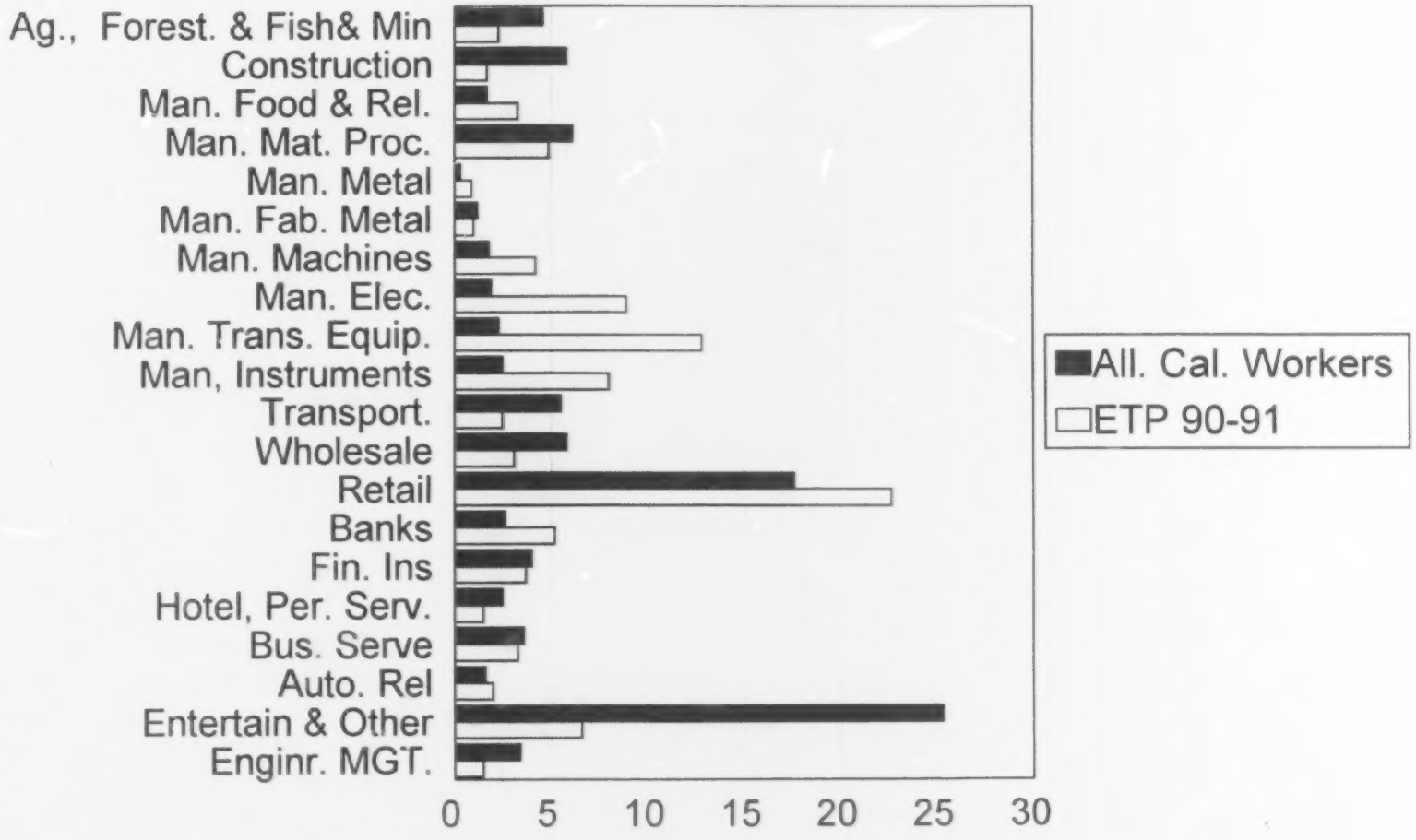
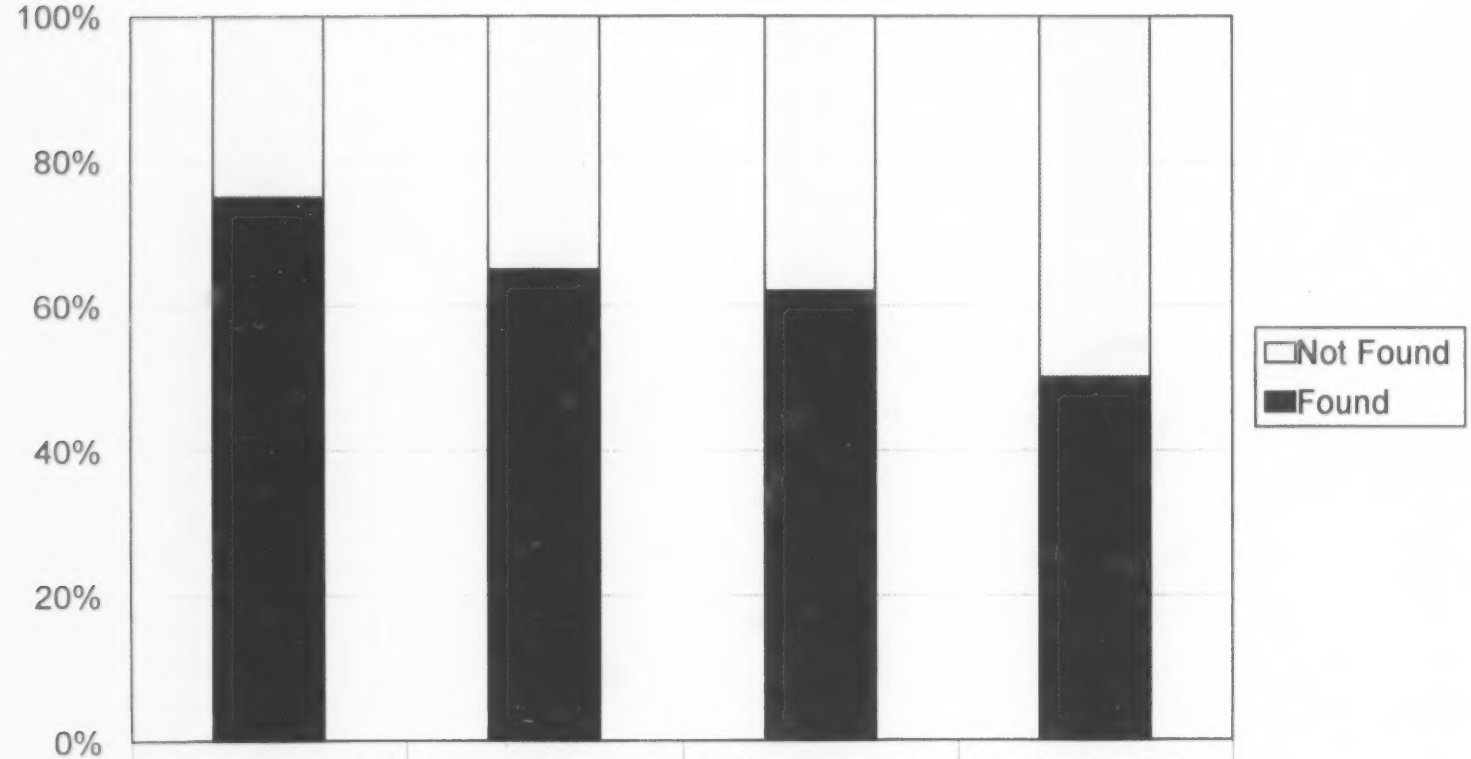


Figure 19
Trainees Found Year Before ,Year 1 and Year 2 After Training
Retrainees 1990-1991

	Retrain Comp. Y1	Retrain Comp. Y2	Retrain Drop Y1	Retrain Drop Y2
Not Found	18	24	31	39
Found	82	76	69	61

Figure 20
Trainees Found Year 1 and Year 2 After Training
New Hires 1990-1991

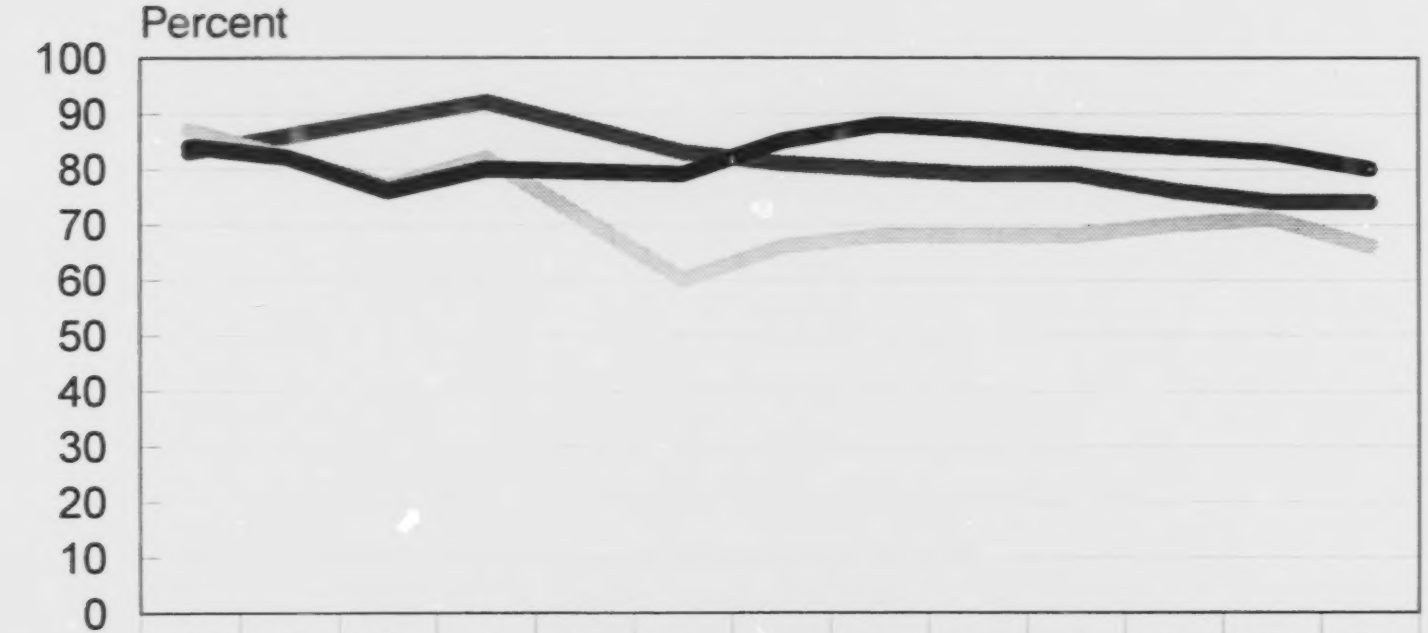


	N Hire Com Y1	N Hire Com Y2	N Hire Drop Y1	N Hire Drop Y2
Not Found	25	35	38	50
Found	75	65	62	50

A quarter-by-quarter analysis shows patterns of stability for both trainees and Controls and indicates that completing training had a positive impact on retention in the labor market. It is important to note that this analysis is not restricted to the trainees found four quarters before training, four quarters after, and eight quarters after. Figures 21 and 22 show the percent of trainees found each quarter. Hence a trainee may leave the labor market and then return and be counted again in this analysis. Prior to training, Retrainee Completers and Dropouts were more likely to be out of the labor market than Controls. After training, the proportion of Completers in the labor market rose above the rate for Controls and remained there for the eight quarters tracked as shown in Figure 21. After training, the Dropouts fell far below the Controls and then slowly converged until their labor market participation was almost equal to the Controls seven quarters after training as illustrated in Figure 22. Eight quarters after training we found 80% of Completers still in the labor market compared to only 66% of Dropouts and 74% of the Control group.

New Hires who completed were far more likely to remain in the labor market than either Dropouts or Controls. Prior to training both New Hire Dropouts and Completers were far less likely to be in the labor market than the Controls. This makes sense given that we know they were unemployed when they entered training. Thus we see a steep decline in labor market participation during the year before training from about 90% to 50% for all New Hires. After training, New Hire Completers immediately rose above the Controls and remained there for the eight quarters tracked. Conversely, New Hire Dropouts remain below Controls until the fifth quarter after training and then participated in the labor force at about the same rate as the Controls. Again these results indicate to us that completing New Hire training took workers who were substantially more disadvantaged in the year before training than workers in similar industries and provides them with training that leads to employment stability that is superior to that of similar workers.

Figure 21
Percent of Trainees in Labor Force*
1990-91 Retrainee



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	84	82	76	80	.	79	85	88	87	85	84	83	80
Drops	87	82	77	82	.	60	66	68	68	68	70	71	66
Control Group	83	86	89	92		83	81	80	79	79	76	74	74

* *Percent based on all trainees whether found in year 1 or 2 or not.*

Figure 22
Percent of Trainees in Labor Force*
1990-91 New Hire

	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	88	86	77	52	.	77	85	89	89	88	88	87	86
Drops	87	84	71	51	.	59	70	73	75	76	77	76	75
Control Group	83	86	89	92		83	81	80	79	79	76	74	74

** Percent based on all trainees whether found in year 1 or 2 or not.*

Retrainee Earnings: Year 1 and Year 2 After Training

Our analysis of earnings shows that both Retrainees and New Hires who completed had larger increases in earning than Dropouts or the Control group. This analysis is based on trainees who were in the California labor market four quarters before training, four quarters after training, and eight quarter after training. We restrict the analysis to this group because it is difficult to generalize about the experience of the trainees who were not found. They may have moved and are now working outside California; they may be working in jobs not covered by UI, such as federal jobs or self employment; they may have died or retired; they may have simply left the labor force to raise children or attend school; and some may be discouraged workers who have been unable to find jobs. Again, we report the real earnings by stating them in 1990 dollars.

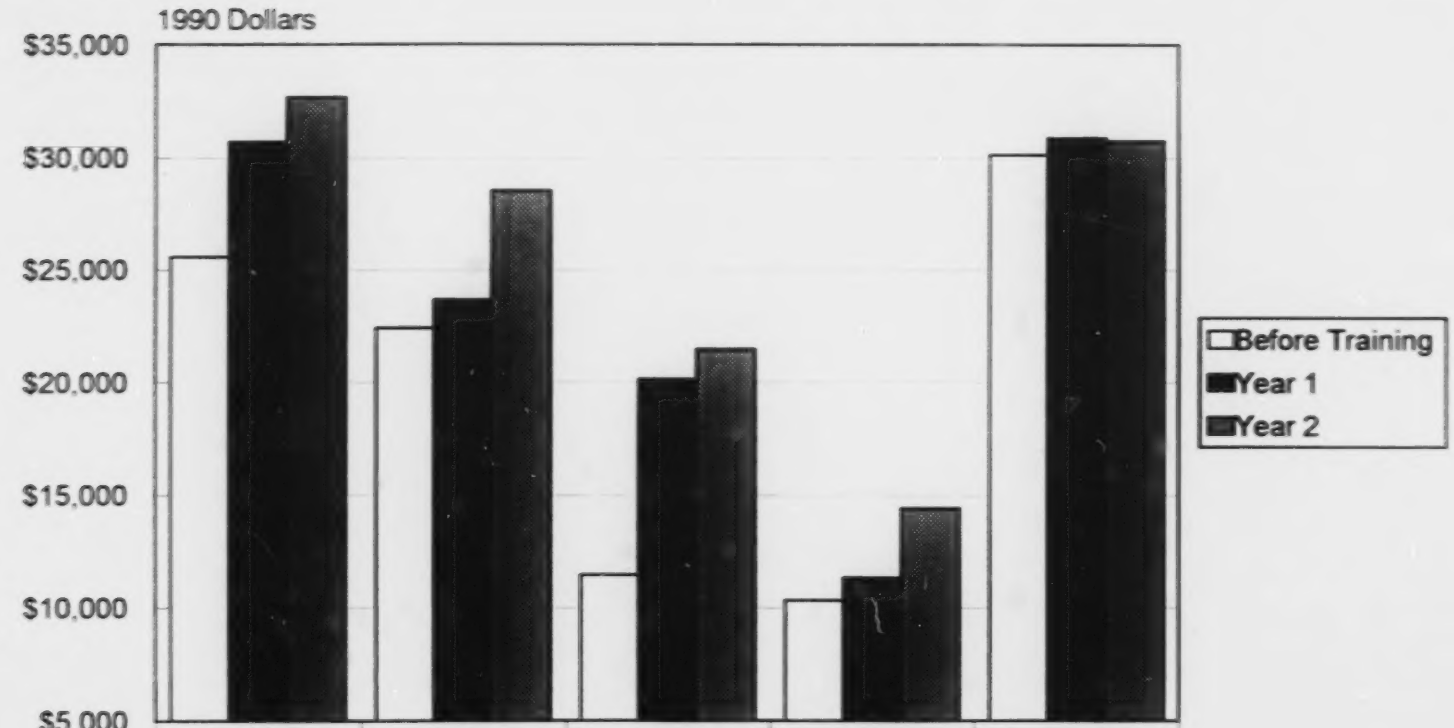
Our analysis shows that both Retrainee and New Hire Completers, who remain in the labor market the entire period studied, retain the earnings gains they had the year immediately after training and had additional gains in Year 2. This contrasts sharply with the Controls who had a small gain in Year 1 and then a small decline in Year 2.

As Figure 23 indicates, Retrainee Completers had a $5,000 increase from the year before to the year after training, and an additional increase of about $2,000 in the second year after training. Retrainee Dropouts who remain in the labor market also had earnings gains, but still earned less than the Completers. Retrainee Dropouts had a smaller increase of $1,200 in the year after training and a substantial increase of almost $5,000 in the second year after training, although their total earning remained $5,000 less than the Completers two years after training.

The differences were even greater for New Hires. New Hire Completers saw their earnings soar by almost $9,000 in the year after training, and increase again by $1,300 in the second year after training. In contrast New Hire Dropouts had a slight increase in the year after training of about $1,000, and a larger increase of $3,000 in Year 2. Despite these increases, they still earned over $7,000 less than Completers two years after training.

An analysis of the quarter-by-quarter earnings of the different trainee groups contrasted with the Control group (Figures 24 and 25) reveals the underlying pattern of earnings. Both Retrainee Completers and Dropouts suffered declining earnings in the year before training. The earnings fell from near the Control group average to substantially below the Control group, indicating that these workers were indeed at risk. After training both groups saw their earnings rise. Completers' earnings rose above the Control group in the second quarter after training and remained above the Controls for the rest of the follow up period, with the exception of quarter six. The Dropouts' earning increased but they remained below the Controls until they converged with them in quarter seven.

Figure 23
Annual Earnings
New Hires and Retrainees 1990-91

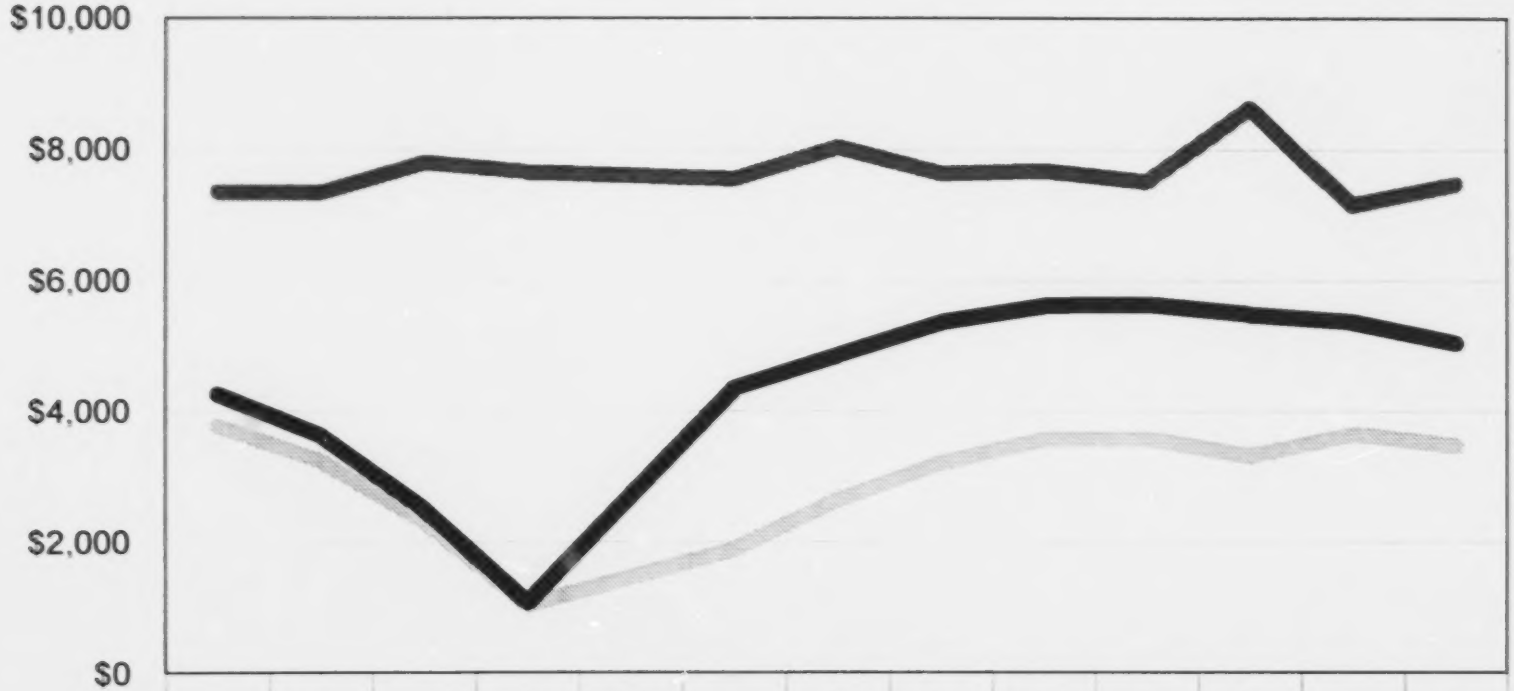


	Retrain Comp.	Retrain Drop	New Hire Comp.	New Hire Drop	Control Group
Before Training	$25,564	$22,410	$11,442	$10,320	$30,110
Year 1	$30,697	$23,654	$20,148	$11,305	$30,877
Year 2	$32,660	$28,511	$21,476	$14,396	$30,742

Figure 24
Quarterly Earnings Before And After Training
1990-91 Retrainees

	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	$7,721	$7,287	$6,407	$4,149		$6,683	$7,626	$8,106	$8,282	$8,282	$8,115	$8,117	$8,146
Drops	$6,968	$6,519	$5,413	$3,511		$4,146	$5,713	$6,697	$7,097	$7,154	$7,109	$7,159	$7,088
Control Group	$7,341	$7,335	$7,790	$7,644		$7,547	$8,036	$7,625	$7,669	$7,500	$8,629	$7,147	$7,467

Figure 25
Quarterly Earnings Before And After Training
1990-91 New Hires



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	$4,245	$3,611	$2,496	$1,070		$4,342	$4,847	$5,351	$5,609	$5,629	$5,470	$5,353	$5,023
Drops	$3,756	$3,225	$2,307	$1,032		$1,895	$2,635	$3,207	$3,568	$3,574	$3,311	$3,641	$3,470
Control Group	$7,341	$7,335	$7,790	$7,644		$7,547	$8,036	$7,625	$7,669	$7,500	$8,629	$7,147	$7,467

New Hires, both Completers and Dropouts, had almost identical earning in the year before training. Both groups earned substantially less than Controls and experienced a steep decline in earnings in the year before training. After training the Completers and Dropouts diverged as shown in Figure 25. Earning rose dramatically for Completers although they remained below the Control group for the entire follow-up period. Dropouts experienced a slow increase in earnings but they remained substantially below both the Completers and the Control group throughout the follow-up period.

1990-91 UI Payments and Weeks:

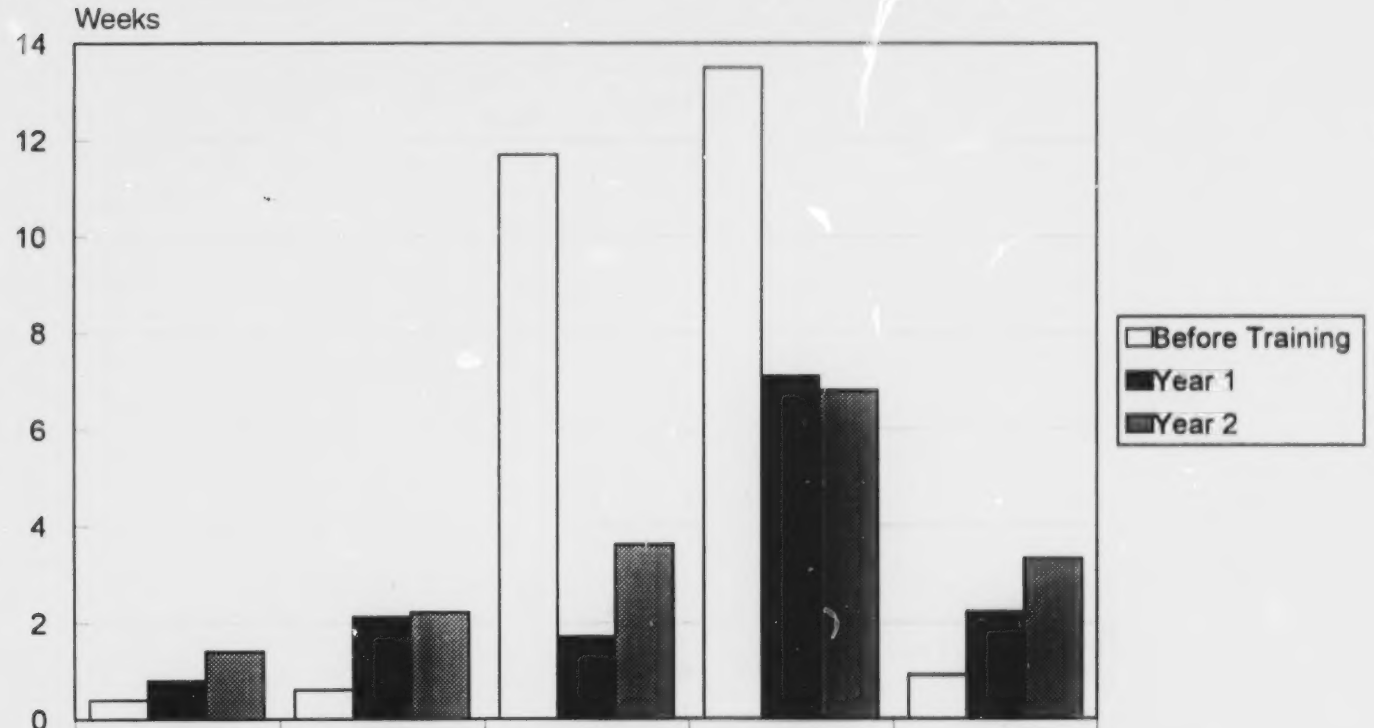
Among both Retrainees and New Hires, Completers were unemployed less often and collected less in UI Payments than Dropouts, in both Year 1 and Year 2 after training. Retrainee Completers were consistently unemployed less than the Control group, while New Hire Completers were unemployed less than the Controls in Year 1, but were unemployed about the same amount as the Controls in Year 2.

UI Weeks

The results indicate that Retrainees who completed were unemployed less than the typical worker in both the pre-training year and the follow-up period, as depicted in Figure 26. Conversely, Dropouts went from being unemployed less than Controls in the pre-training year to being unemployed about the same as the Controls. Retrainees who completed training were unemployed an average of less than half a week in the year before training, compared to .8 weeks for the Dropouts and .9 weeks for the Controls. This rose to an average of .8 weeks for Completers in the year after training, 2.1 weeks for Dropouts and 2.2 weeks for Controls. Again the general rise in unemployment due to the recession was likely the cause of this overall increase.

New Hires who completed dramatically decreased their unemployment from the high levels they experienced before training. Dropouts had a smaller but still substantial decline. The New Hires who completed averaged 11.7 weeks of unemployment in the year before training, and after training the average fell by over eighty percent to 1.7 weeks. Completers unemployment rose slightly in Year 2 to 3.6 weeks. This increase was probably due to the continuing recession in California during this period. New Hires who dropped out also had a substantial decline from 13.5 weeks before training to 7.1 weeks after training, and another small decline in Year 2 to 6.8 weeks. It is important to note that New Hire Dropouts were still unemployed approximately twice as much as the Completers and the Controls.

Figure 26
Average Annual Weeks of Unemployment
New Hires and Retrainees 1990-91



	Retrain Comp.	Retrain Drop	New Hire Comp.	New Hire Drop	Control Group
Before Training	0.4	0.6	11.7	13.5	0.9
Year 1	0.8	2.1	1.7	7.1	2.2
Year 2	1.4	2.2	3.6	6.8	3.3

Figures 27 and 28 show the pattern of unemployment quarter-by-quarter for all four groups. The trend for Retrainees shows that prior to training Completers were unemployed less than the Controls. The pattern was more volatile for Dropouts, who were unemployed more than Controls in the fourth quarter before training and then unemployed less in the rest of the pre-training year. After training Completers are unemployed substantially less than the Controls, while Dropouts are unemployed more than Controls immediately after training and then fall below the Controls for the balance of the follow-up period. For all groups we see continually rising unemployment as the recession persists.

For New Hires the pattern is different. New Hire Completers and Dropouts were both unemployed far more than the Controls prior to training. After training, Completers dropped immediately to the Control group average and then tracked the Control group for the rest of the follow-up period. Dropouts also had a steep decline in unemployment but remained unemployed more than either Completers or Controls for the follow-up period.

The average UI payments to the four groups largely reflects the differing patterns of pre- and post-year unemployment experienced by these groups. As shown in Figure 29, the 1990-91 Retrainee Completers had low average UI payments, $47 in the year prior to training, which rose to $129 in Year 1 and to $248 in Year 2. Retrainee Dropouts had a much more dramatic increase from $74 in the year before training to $319 in Year 1 and $368 in Year 2 after training. Controls had their UI payments increase from $90 in the year before training to $305 in Year 1 and then $505 in Year 2.

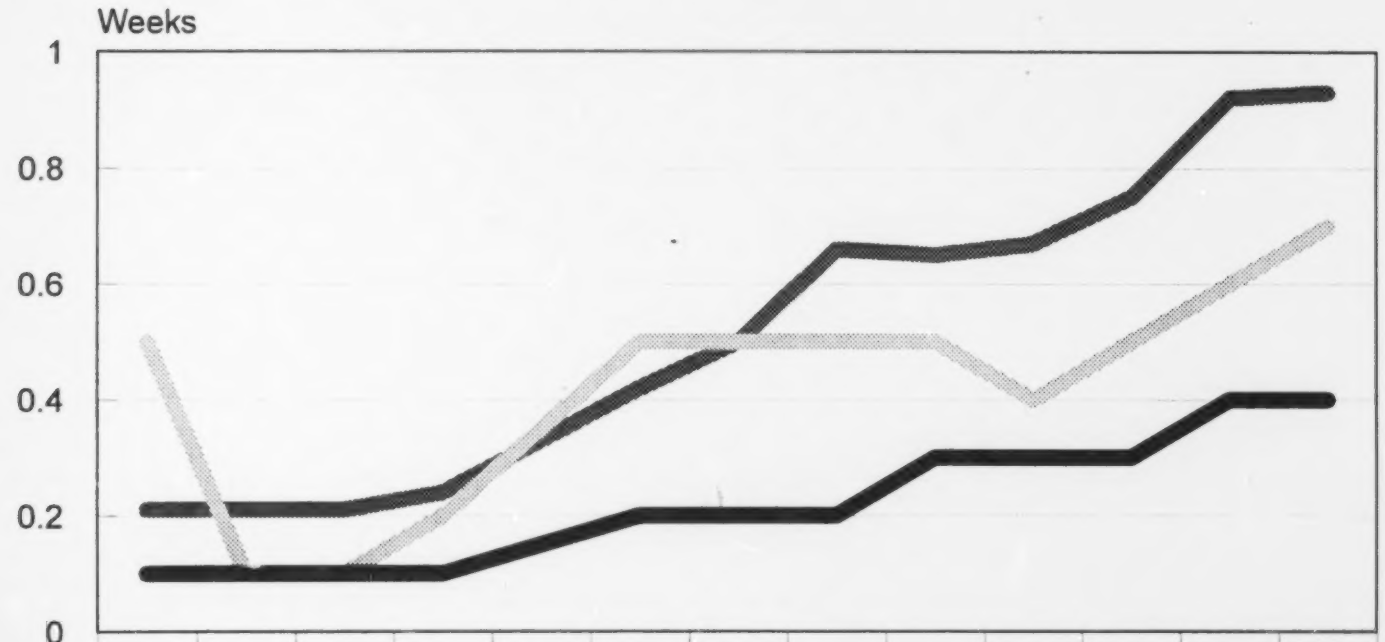
The pattern was different for New Hires. New Hire Completers' average UI payment fell by about 85% from $1,499 before training to only $222 in Year 1, and then increased to $548 in Year 2 after training. New Hire Dropouts had large payments before training also, $1,497, which then declined 47% to $788 in Year 1 and then held just about constant in Year 2.

As shown in Figures 30 and 31, the quarter-by-quarter comparison of UI payments made to Retrainee Dropouts and Completers and New Hire Dropouts and Completers tracks the earlier pattern identified for weeks of unemployment.

Multiple Employers

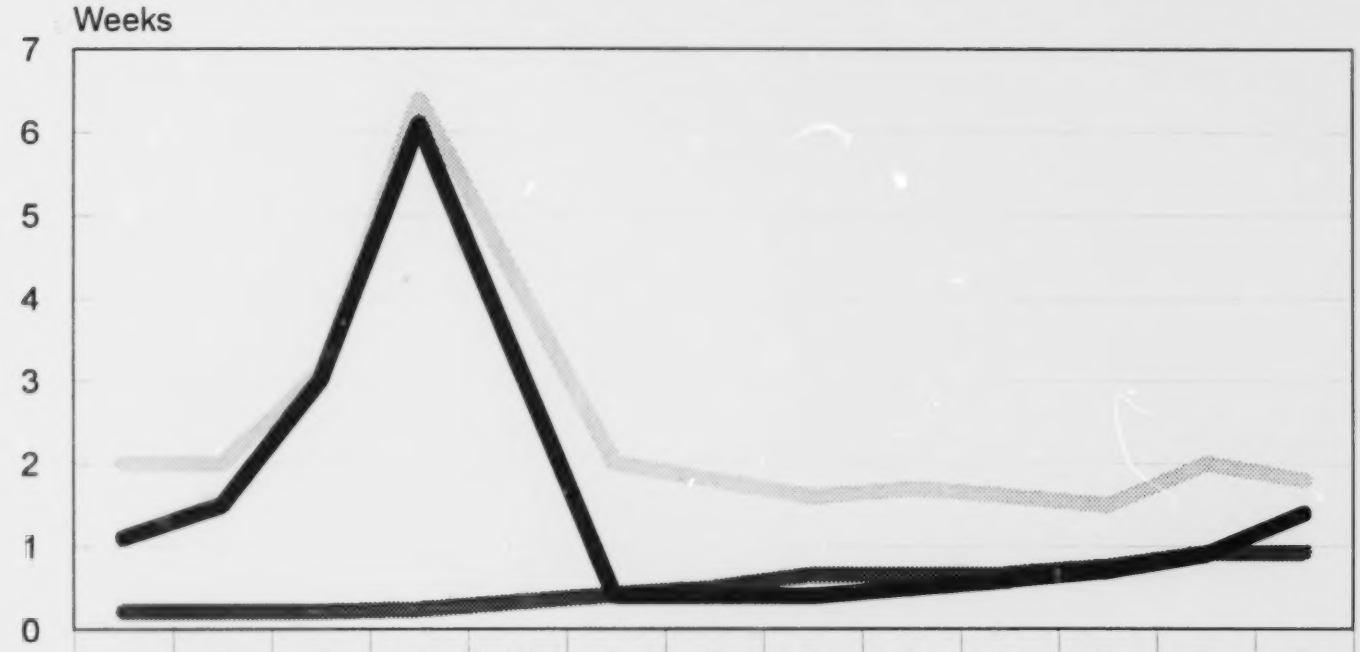
Data collected this year allowed us to identify workers who had more than one employer in any particular quarter. Workers may report more than one employer if they changed jobs during the quarter or if they are simultaneously employed by more than one employer. The data presented here simply show the average number of employers reported each quarter for those who reported any earnings. That is, this analysis is not restricted to trainees who present four quarters before, four quarters after, and eight quarters after training as it was in the preceding analysis.

Figure 27
Average Quarterly Weeks UI Before And After Training
1990-91 Retrainees



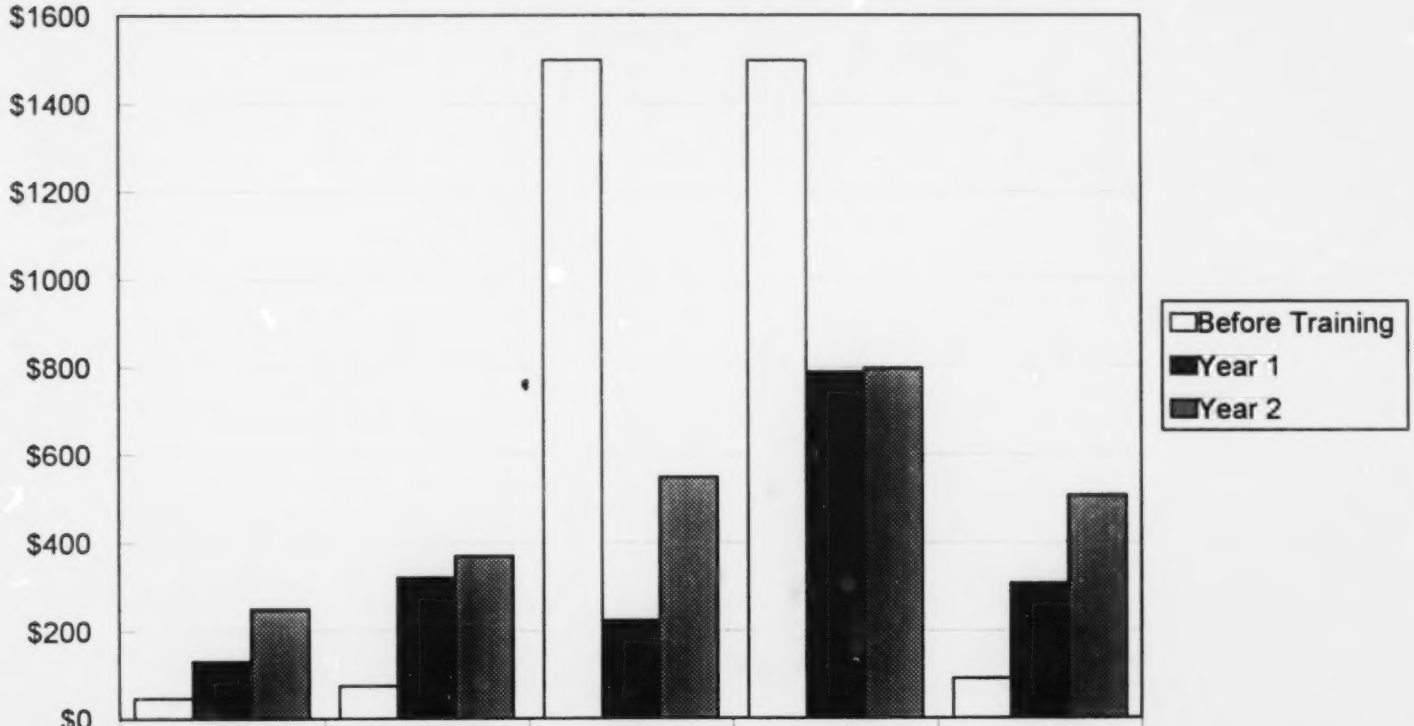
	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	0.1	0.1	0.1	0.1	.	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
Drops	0.5	0.1	0.1	0.2	.	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.7
Control Group	0.21	0.21	0.21	0.24		0.42	0.5	0.66	0.65	0.67	0.75	0.92	0.93

Figure 28
Average Quarterly UI Weeks Before And After Training
1990-91 New Hires



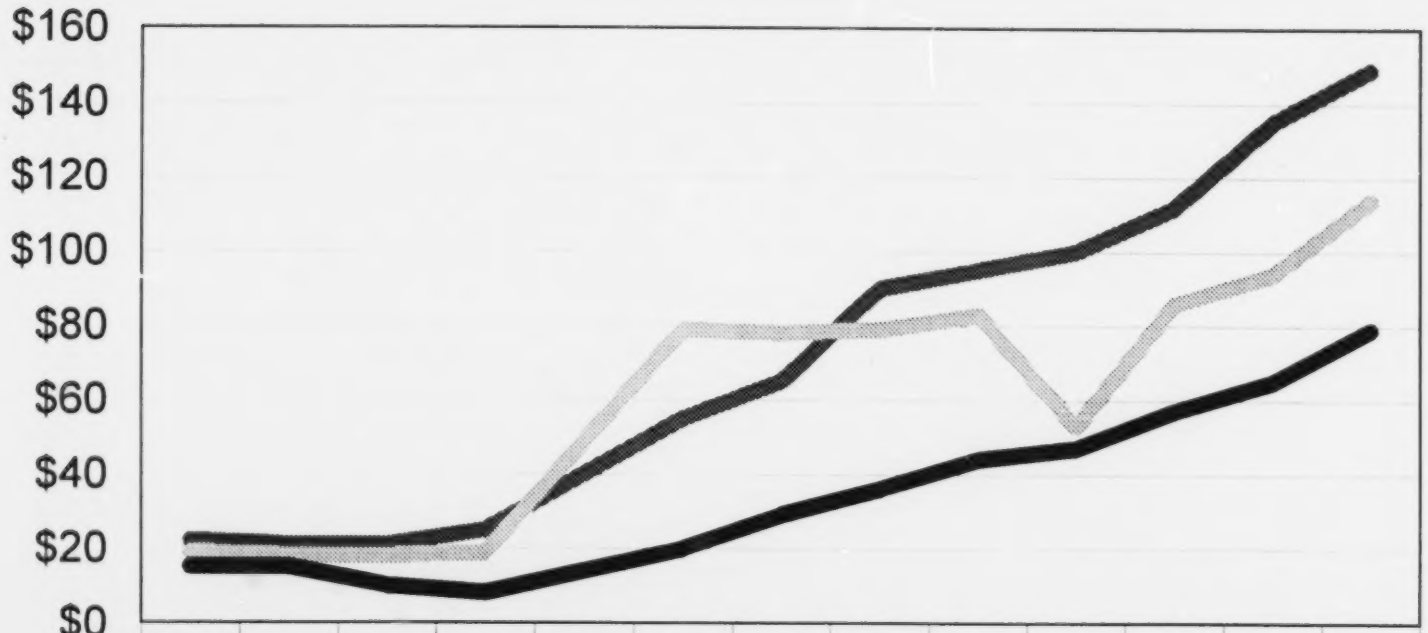
	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	1.1	1.5	3	6.1		0.4	0.4	0.4	0.5	0.6	0.7	0.9	1.4
Drops	2	2	3.1	6.4	.	2	1.8	1.6	1.7	1.6	1.5	2	1.8
Control Group	0.21	0.21	0.21	0.24		0.42	0.5	0.66	0.65	0.67	0.75	0.92	0.93

Figure 29
Average Annual Unemployment Insurance Payments
New Hires and Retrainees 1990-91



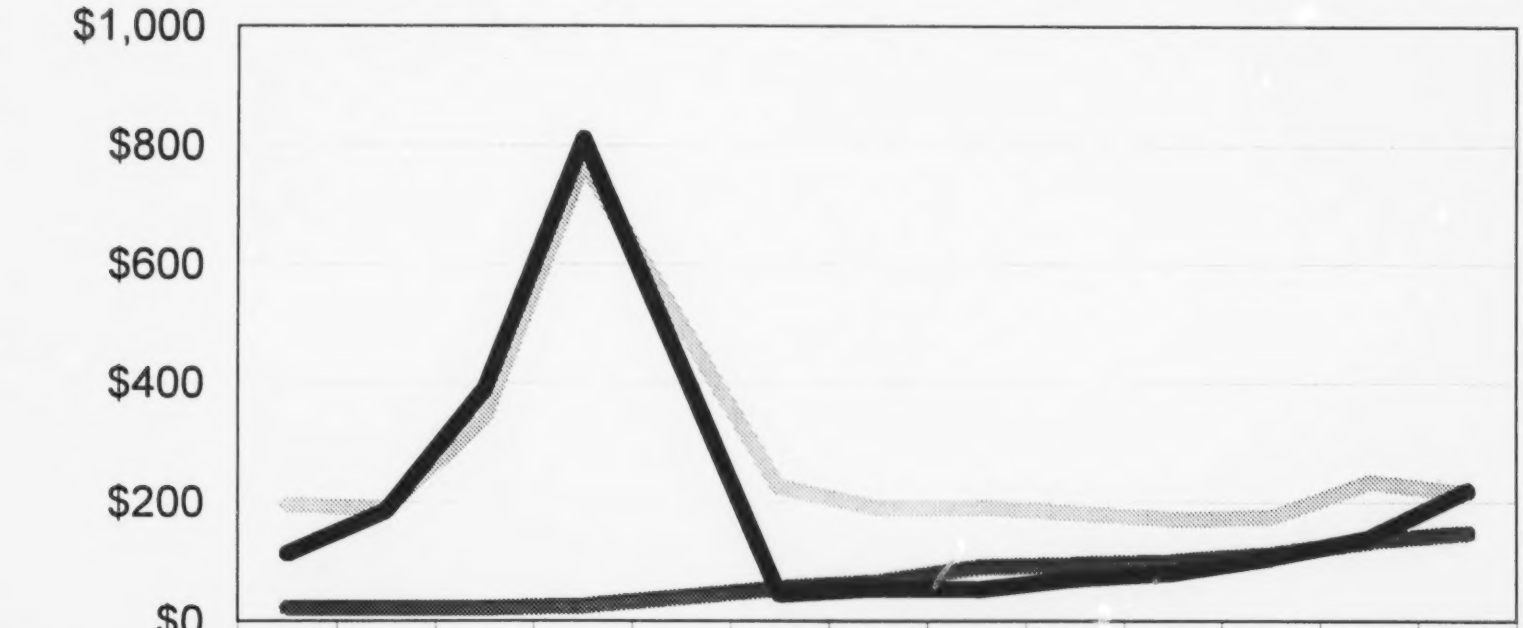
	Retrain Comp.	Retrain Drop	New Hire Comp.	New Hire Drop	Control Group
Before Training	$47	$74	$1499	$1497	$90
Year 1	$129	$319	$222	$788	$305
Year 2	$248	$368	$548	$796	$505

Figure 30
Average UI Payments By Quarter
1990-91 Retrainee



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	$15	$15	$10	$8		$20	$29	$36	$44	$47	$57	$65	$79
Drops	$19	$18	$18	$19	.	$79	$78	$79	$83	$53	$86	$94	$114
Control Group	$22	$21	$21	$25		$55	$65	$90	$95	$100	$112	$135	$149

Figure 31
Average UI Payments By Quarter
1990-91 New Hire



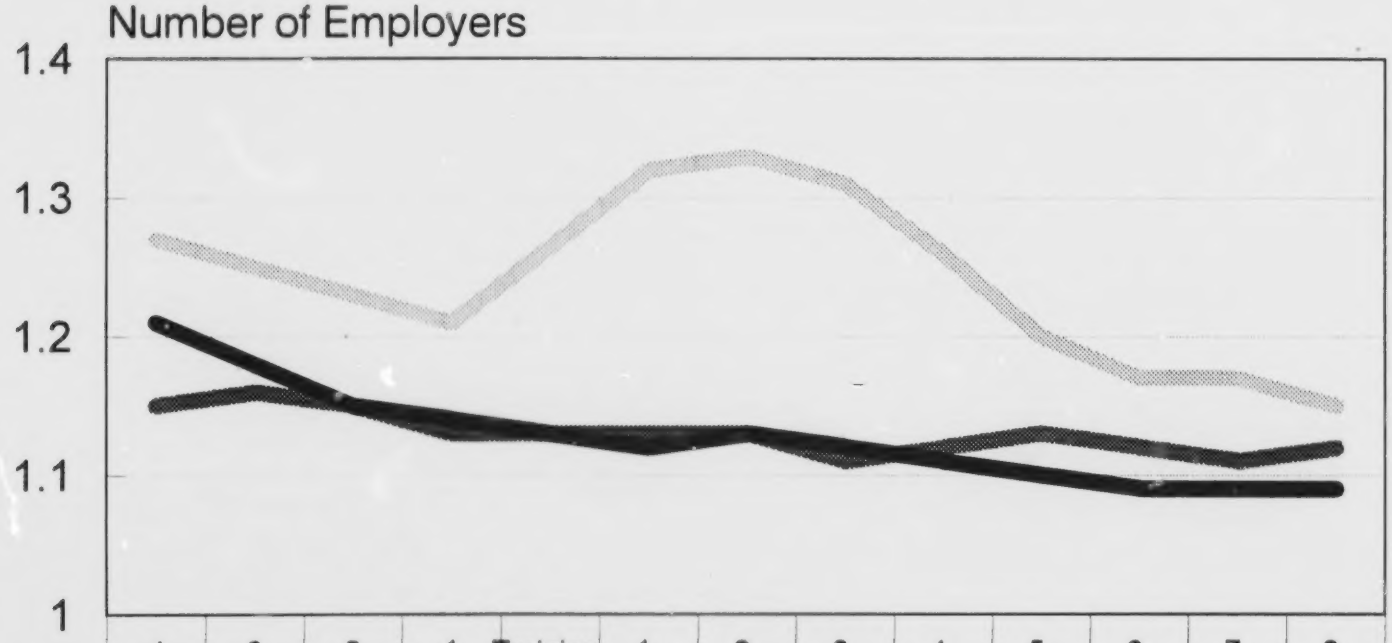
	22	21	21	25		55	65	90	95	100	112	135	149
Completers	$113	$185	$390	$811	.	$45	$54	$52	$71	$81	$107	$140	$220
Drops	$195	$188	$342	$772	.	$225	$189	$191	$182	$171	$175	$234	$215
Control Group	$22	$21	$21	$25		$55	$65	$90	$95	$100	$112	$135	$149

The interpretation of the implications of changes in the average number of employers is difficult. In general a higher average number of employers may indicate less employment stability. An increase in the average number of jobs may indicate that workers are changing jobs more frequently or have lost their primary job and are patching together several part-time jobs to make ends meet. It may indicate that workers have had their hours reduced at their regular job and have added a part-time job to make up for lost hours. A final interpretation is that a fully employed worker is moonlighting to make extra money.

Figures 32 and 33 show the average number of employers for Retrainees and Controls per quarter. The Controls showed the least variation, remaining between 1.11 and 1.16 in the number of employers per quarter. If we assume that most people with more than one employer only have two (which is usually the case), we could interpret these number to indicate that between 11% and 16% of workers had multiple employers. Figure 32 shows both Retrainee groups started above 1.2 employers in the fourth quarter before training and both groups decreased the number of employers as they approached the training period, although the Dropouts were consistently about .07 employers per quarter above the Completers. After training the Completers dropped to the level of the Control group and moved below that level in the second year out. The Retrainee Dropouts shot up after training to 1.33 employers per quarter and remained substantially above the Completers and the Control group for the first year after; then the Dropouts experienced a decrease that moved them toward Control group in the second year, where they attained the top end of the Control group range in the eighth quarter after training. The Dropouts also had higher levels of unemployment and this may indicate that Dropouts were more likely to combine several part-time jobs or change jobs more frequently than other groups. Interestingly the number of employers declined slightly for all groups in the year after training. This may be caused by overall improvements in the economy as California slowly emerged from the recession and more permanent full-time jobs became available.

New Hires displayed a somewhat different pattern as illustrated in Figure 33. Both New Hire Completers and Dropouts had a substantially higher average number of employers than Controls in the year before training. This lends credence to the notion that a higher number of employers per quarter is linked to economic distress, since the New Hires experienced significantly higher unemployment rates throughout this period. It may indicate that many New Hires lacked stable employment prior to training and were patching together two part-time jobs to earn a living or changing jobs when they were laid off. In the quarter after training the average number of employers decreased somewhat for Dropouts and declined rapidly for Completers, who fell to the level of the Control group and remained there for the balance of the follow-up period. These data seem to indicate that completing training leads New Hires to significant increases in steady full-time employment typical of the workers in the Control group.

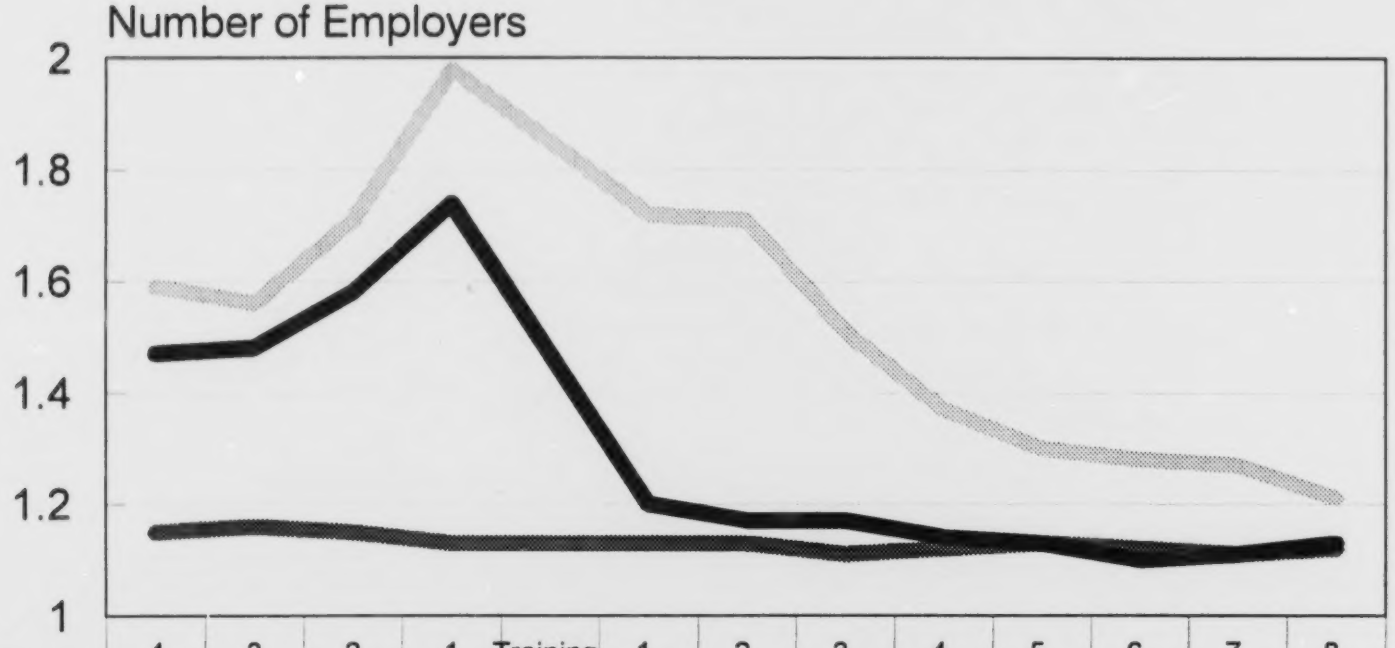
Figure 32
Average Number of Employers By Quarter*
1990-91 Retrainee



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	1.21	1.18	1.15	1.14	.	1.12	1.13	1.12	1.11	1.1	1.09	1.09	1.09
Drops	1.27	1.25	1.23	1.21		1.32	1.33	1.31	1.26	1.2	1.17	1.17	1.15
Control Group	1.15	1.16	1.15	1.13		1.13	1.13	1.11	1.12	1.13	1.12	1.11	1.12

Averages include only trainees with earnings in each quarter.

Figure 33
Average Number of Employers By Quarter*
1990-91 New Hire



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8
Completers	1.47	1.48	1.58	1.74	.	1.2	1.17	1.17	1.14	1.13	1.1	1.11	1.13
Drops	1.59	1.56	1.71	1.98	.	1.72	1.71	1.51	1.37	1.3	1.28	1.27	1.21
Control Group	1.15	1.16	1.15	1.13		1.13	1.13	1.11	1.12	1.13	1.12	1.11	1.12

** Averages include only trainees with earnings in each quarter.*

1989-90 Trainees: Year 1, Year 2, and Year 3 After Training

In this analysis we track trainees from projects that completed in 1989-90 to the third year after training. Once again we compare the experience of Retrainee and New Hire Completers and Dropouts with a Control group. In this case we define the population differently than we did for previous cohorts. Over the course of three years the attrition of Dropouts out of the California labor market is so much greater than that of Completers that if we defined the population as only those trainees who were in the labor force four quarters before training, and four, eight, and twelve quarters after training, we would be reduced to a very small and atypical groups of Dropouts.

Trainees By Industry

Figure 34 shows the distribution of trainees, both Retrainees and New Hires Completers and Dropouts combined, by industry group in which they worked their first quarter after training. The graph reveals that in 1989-90 ETP industry distribution was substantially different than in 1991-92. The largest industry groups were retail and banking, two industries generally viewed as non-basic industry. There were a substantial number of trainees in various manufacturing areas, particularly the manufacture of electrical equipment and manufacture of machines, transportation equipment, which includes aerospace, and instruments manufacturing areas. ETP trainees were also represented disproportionately in business services. ETP trainees were disproportionately under-represented in construction, agriculture, forestry, fishing and minerals, wholesale services, and other service areas.

Employment Stability

In 1991-92 and 1990-91 we found that 1989-90 ETP trainees who completed training had substantially more employment stability than Dropouts or workers in the Control group. These results are presented in Figures 35 and 36. A key measure of stability is whether or not trainees remained in the California labor market. This measure is important because as long as trainees remain within the California labor market their training may contribute to the state's economy.

A quarter-by-quarter analysis shows patterns of stability for both trainees and Controls and indicates that completing training had a positive impact on retention in the labor market. It is important to note that this analysis is not restricted to the trainees found four quarters before training, and four, eight and twelve quarters after training. Hence a trainee may leave the labor market and then return and be counted again in this analysis. Figures 37 and 38 show the percent of trainees found each quarter. Prior to training

Figure 34
Industry Distribution
All California Workers and 1989-90 Trainees

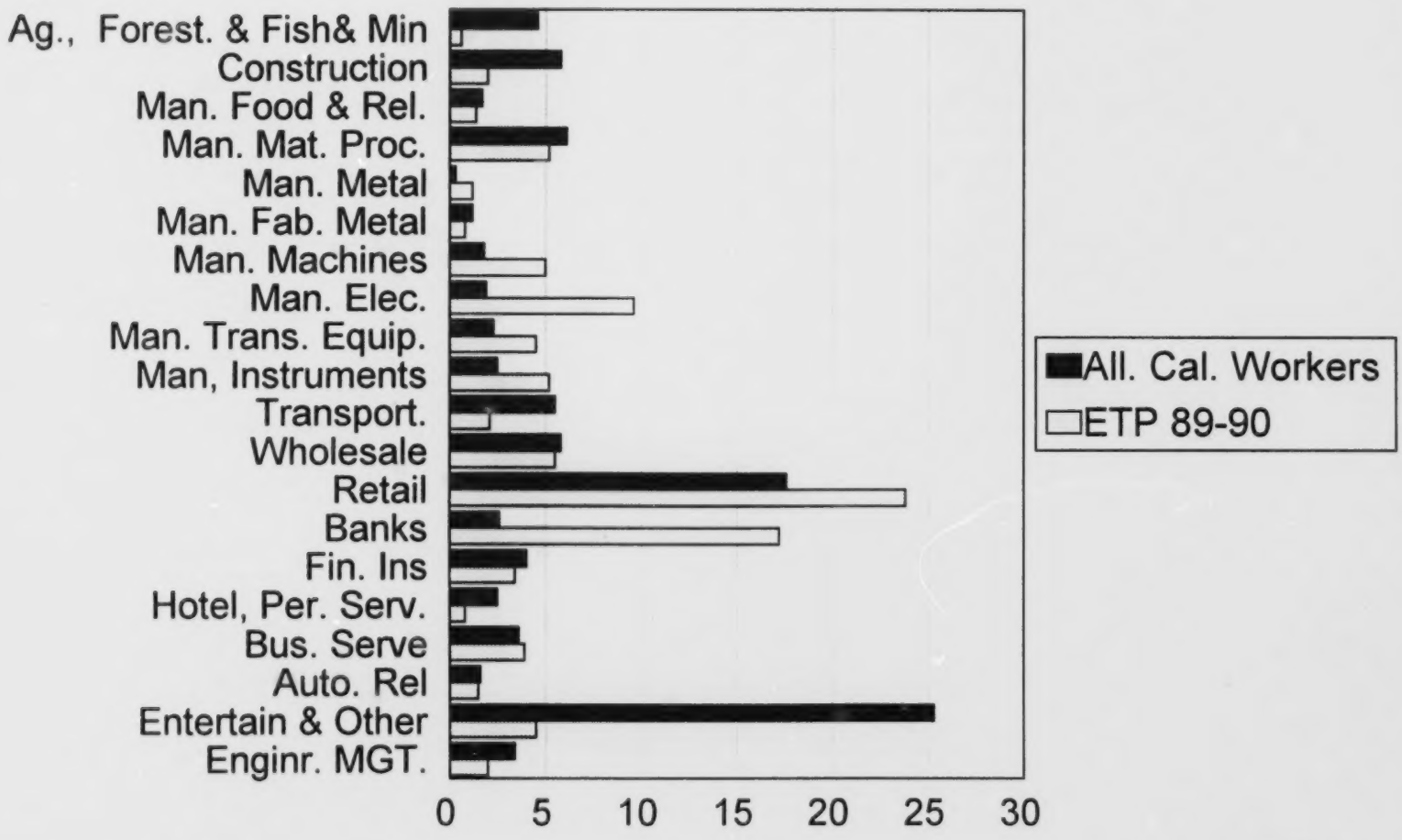
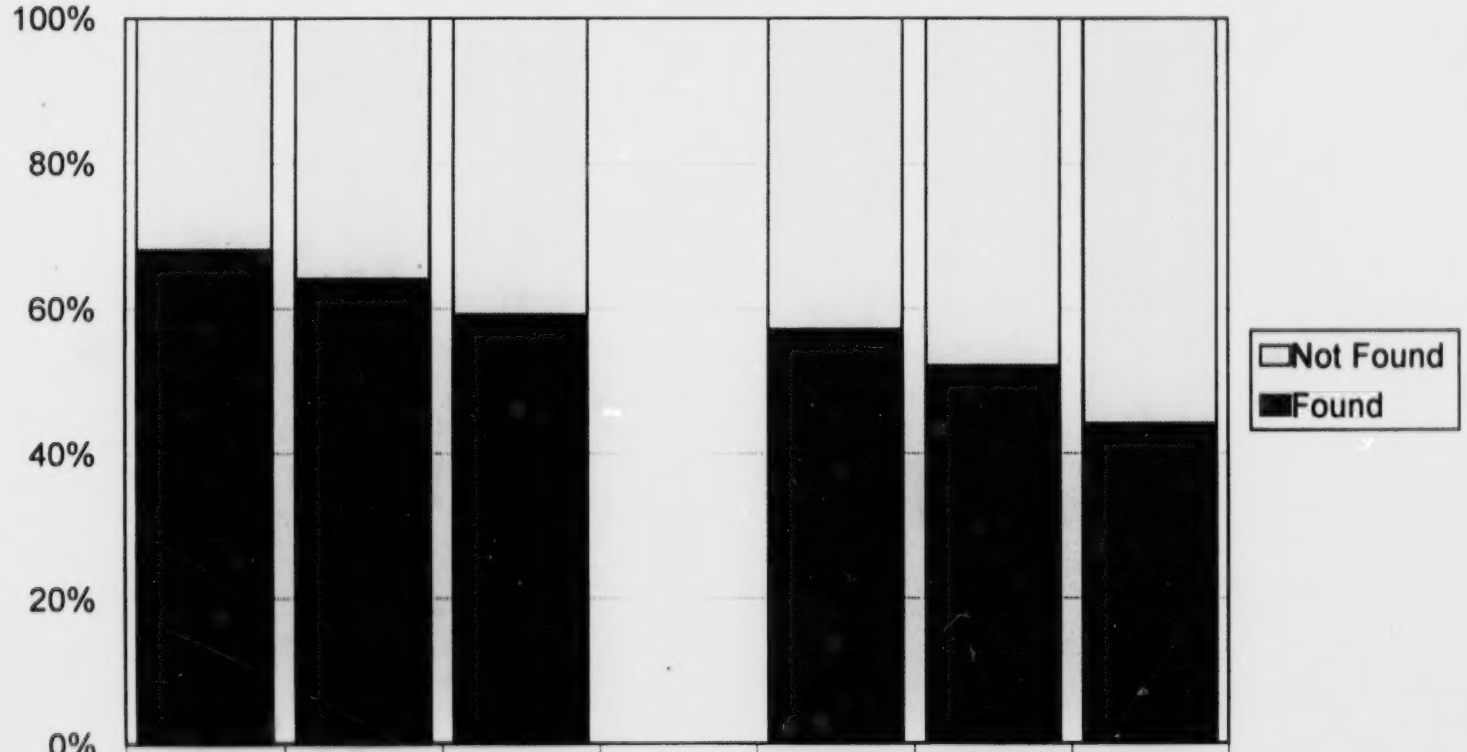


Figure 35
Trainees Found Year Before and Year 1, 2 and 3 After Training
Retrainees 1989-90

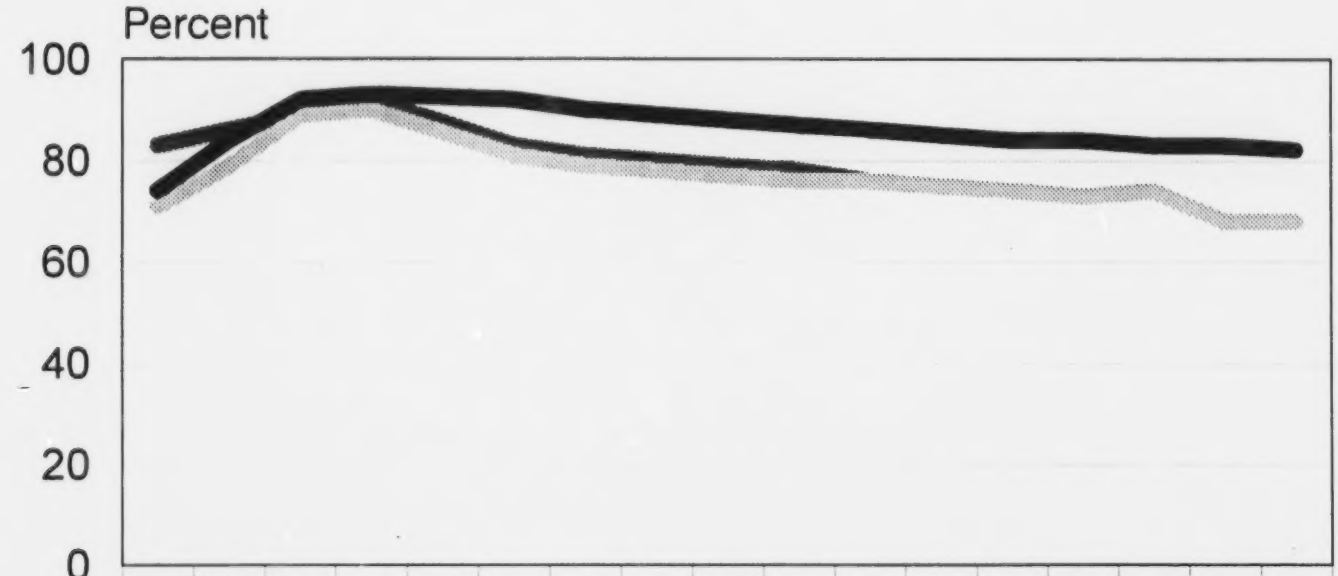


	Comp Y1	Comp Y2	Comp Y3		Drop Y1	Drop Y2	Drop Y3
Not Found	32	36	41		43	48	56
Found	68	64	59		57	52	44

Figure 36
Trainees Found Year Before and Year 1, 2 and 3 After Training
New Hires 1989-90

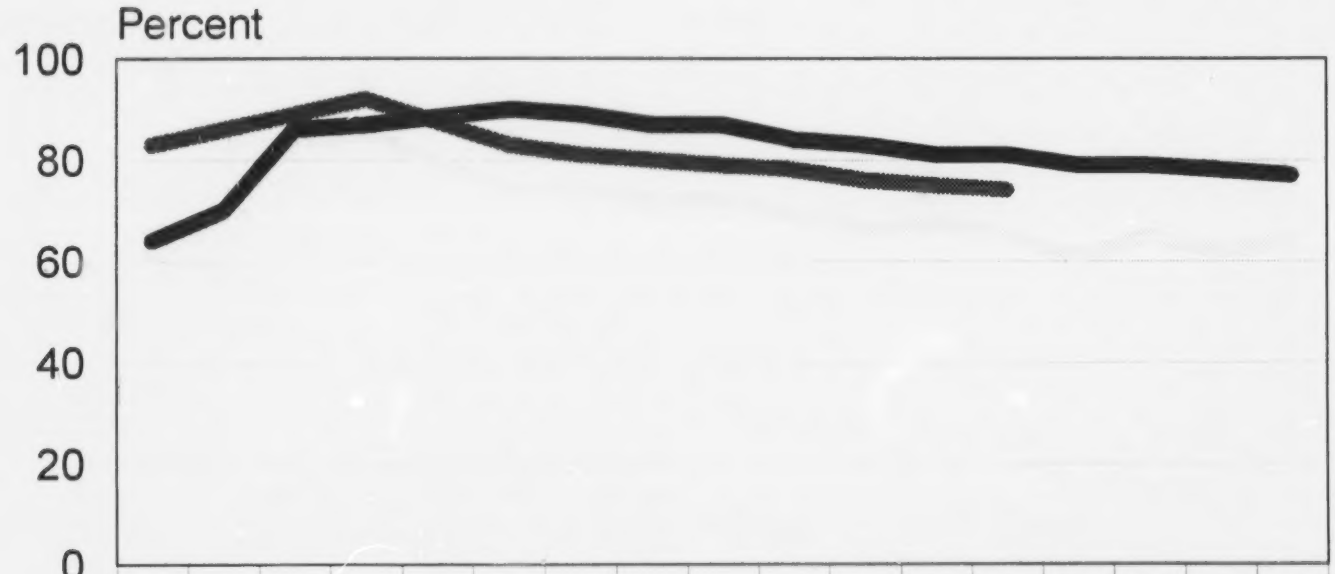
	Comp Y1	Comp Y2	Comp Y3		Drop Y1	Drop Y2	Drop Y3
Not Found	32	36	41		55	63	69
Found	58	52	47		45	37	31

Figure 37
Labor Force Participation By Quarter
1989-90 Retrainees



	-4	-3	-2	-1	T	1	2	3	4	5	6	7	8	9	10	11	12
Completers	74	84	92	93	.	92	90	89	88	87	86	85	84	84	83	83	82
Drops	71	79	89	90	.	81	79	78	77	76	76	75	74	73	74	68	68
Control Group	83	86	89	92		83	81	80	79	78	76	75	74				

Figure 38
Labor Force Participation By Quarter
1989-90 New Hires



	-4	-3	-2	-1	T	1	2	3	4	5	6	7	8	9	10	11	12
Completers	64	70	86	87	.	90	89	87	87	84	83	81	81	79	79	78	77
Drops	61	70	84	85	.	74	74	72	72	69	66	67	65	61	65	62	64
Control Group	83	86	89	92		83	81	80	79	78	76	75	74				

Retrainee Completers and Dropouts were more likely to be out of the labor market than Controls. After training the proportion of Completers in the labor market rose above the rate for Controls (because of the manner in which Controls were chosen an equivalent Control group could only be constructed for eight quarters) and remained there for the twelve quarters tracked. After training the Dropouts fell to the level of the Controls and tracked them for the eight quarters measured. Twelve quarters after training we found 82% of Completers still in the labor market compared to only 68% of Dropouts.

New Hires who completed were far more likely to remain in the labor market than either Dropouts or Controls as shown in Figure 38. Prior to training both New Hire Drops and Completers were far less likely to be in the labor market than the Controls. Interestingly, prior to training the experience of Completers and Dropouts were almost identical. After training New Hire Completers immediately rose above the Controls and the Dropouts and remained there for the eight quarters tracked. Conversely New Hire Dropouts remained below Controls for the eight quarters tracked. In the third year after training Drops remain substantially below the Controls. Twelve quarters after training 77% of Completers were still in the California Labor Market compared to 64% of the Dropouts. Again these results indicated to us that completing New Hire training takes workers who were substantially more disadvantaged in the year before than workers in similar industries and provides them with training that leads to employment stability that is superior to that of similar workers. It appears that the improvement in employment stability persists even three years after training.

Retrainee Earnings: Year 1, Year 2, and Year 3 After Training

Our analysis of earnings shows that both Retrainees and New Hires who completed had larger increases in earning than Dropouts or the Control group and that these advantages persisted throughout the follow-up period. This analysis of Completers earnings is for all Completers found in the California labor market each quarter. The quarterly averages are then summed to create the annual earnings figure. The earning of Dropouts are adjusted to assume that the same proportion of Dropouts as Completers remained in the California labor market. For example, in quarter 12 we found 82% of all Completers but only 68% of all Dropouts. To compute the average earnings for Dropouts we added together all earnings reported for Dropouts, then divided it by a number equal to 82% of the Dropouts, the proportion of Completers retained in the California Labor market. In essence this techniques assumes that Dropouts remained in California at the same rate as Completers, and that those Dropouts not found had zero earnings. The resulting real earnings for the 1989-90 cohort are reported in Figures 39 and 40.

Our analysis shows that both Retrainee and New Hire Completers retained the earnings gains they had the year immediately after training. New Hires had additional

gains in Year 2 and a small increase in Year 3. This contrasts with the Control group who had a small gain in Year 1 and a small gain in Year 2. Overall Retrainee Completers went from earning about $2,000 less than the Controls in the year before training to earning slightly more than the Controls in Year 2 after training.

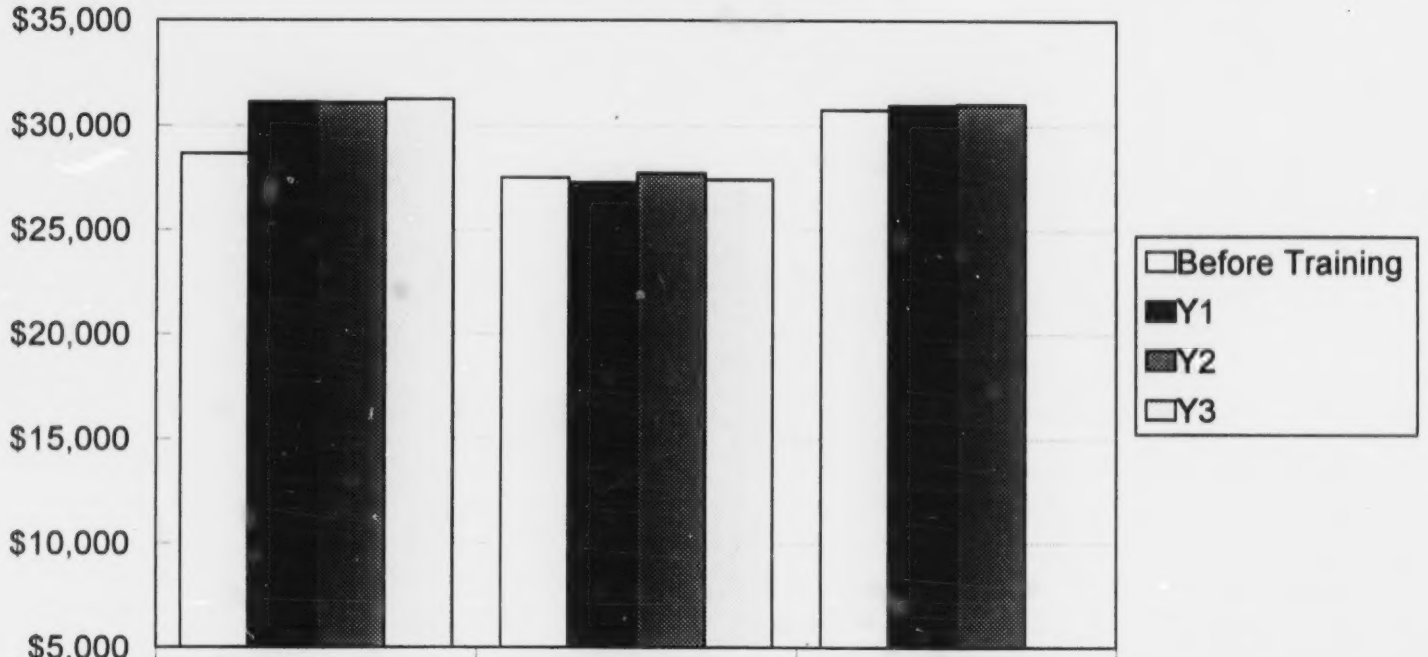
As Figure 39 indicates, Retrainee Completers had a $2,400 increase from the year before to Year 1 after training, no change in Year 2 year after training and a small gain of less than $200 in Year 3. Retrainee Dropouts earned about $1,00 less than Completers in the year before training and consistently earned about $3,000 less in the years after training. Retrainee Dropouts had a small decline in earnings of about $200 in Year 1 after training, a gain of more than $400 in Year 2, and then a decline of $300 in Year 3. After three years Retrainee completes were earning $31,235 compared to $27,419 for Dropouts and $31,008 for Controls.

The differences were even greater for New Hires as shown in Figure 40. New Hire Completers saw their earnings increase over $5,000 in Year 1 after training, and increase again by $1,700 in Year 2 after training. In Year 3 after training Completers had small increase in earnings. In contrast New Hire Dropouts, who had earnings similar to Completers in the year before training, had a sharp decrease in Year 1 after training of $3,500. Their earning fell slightly in Year 2 and Year 3 after training. The Controls had a small increase of about $200 in Year 1 after training and another small increase of $50 in Year 2 after training. In Year 3 after training Completers earned $25,364 compared to only $14,527 for Dropouts.

An analysis of the quarter-by-quarter earnings of the different trainee groups in contrast with the Control group reveals the underlying pattern of earning. Both Retrainee Completers and Dropouts earned slightly less than the Controls in the year before training. After training Completers earnings rose above the Control groups and stayed there with the exception of one quarter. Conversely Dropouts earnings began below both the Completers and Controls and then slowly fell farther below both groups over the twelve follow-up quarters. Twelve quarters after training Dropouts earned over $1,100 less a quarter than Completers. These results appear in Figure 41.

New Hires, both Completers and Dropouts, had almost identical earning in the year before training as shown in Figure 42. Both groups earned substantially less than Controls and experienced a stagnant earnings in the year before training. After training the Completers and Dropouts diverge. Earning rose dramatically for Completers, although they remained below the Control group for the entire follow-up period. Dropouts experienced a steep decline after training and then their earnings remained essentially stagnant, far below both the Completers and the Control group. Twelve quarters after training Completers earned $6,377 a quarter compared to $3,634 for Dropouts.

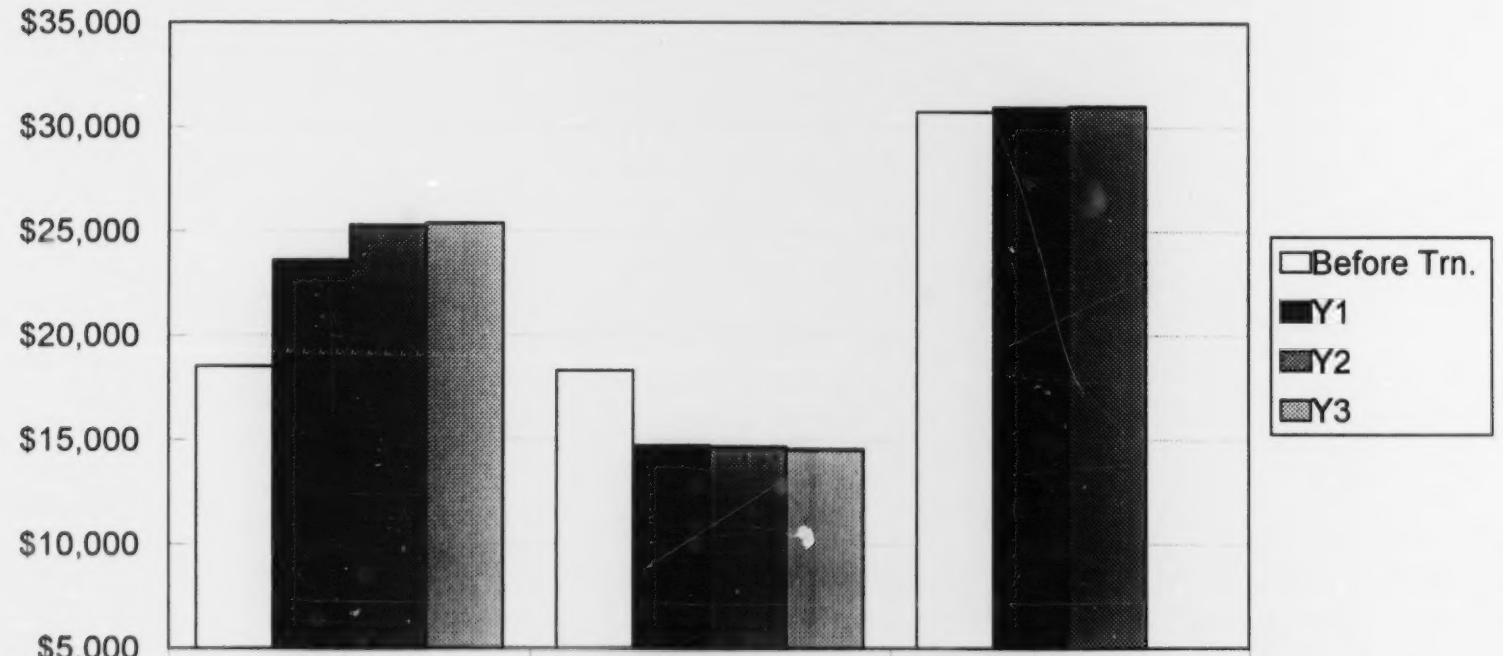
Figure 39
Annual Earnings*
Retrainees 1989-90



	Retrain Comp.	Retrain Drop	Control Group
Before Training	$28,632	$27,504	$30,735
Y1	$31,094	$27,284	$30,956
Y2	$31,082	$27,727	$31,008
Y3	$31,235	$27,419	

**Earnings for completers are based on the average for all completers in the California labor market each quarter. Earning for Dropouts were adjusted to assume that the same proportion of drops as completers remained in the California labor market.*

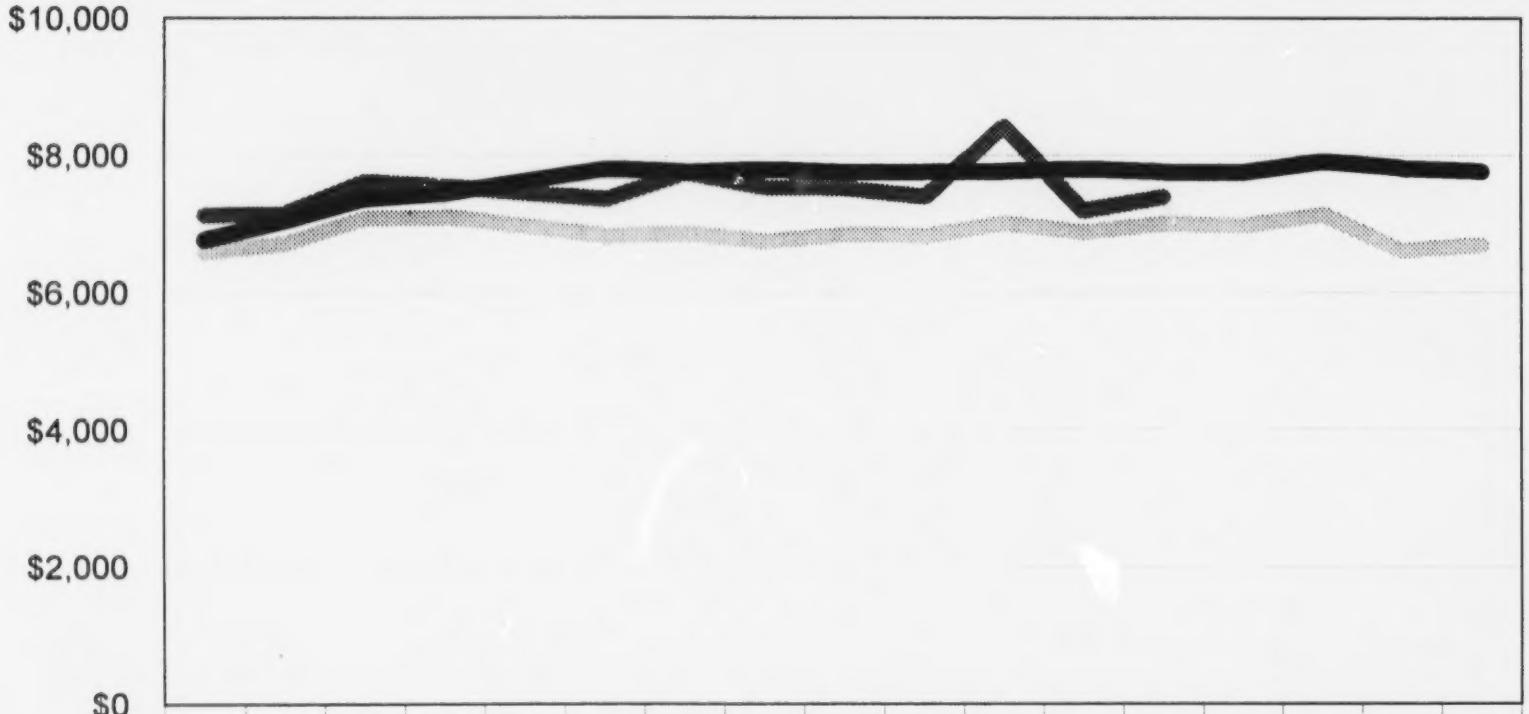
Figure 40
Annual Earnings*
New Hires 1989-90



	New Hire Comp	New Hire Drop	Control Group
Before Trn.	$18,495	$18,285	$30,735
Y1	$23,588	$14,702	$30,956
Y2	$25,264	$14,625	$31,008
Y3	$25,364	$14,527	

**Earnings for completers are based on the average for all completers in the California labor market each quarter. Earning for Dropouts were adjusted to assume that the same proportion of drops as completers remained in the California labor market.*

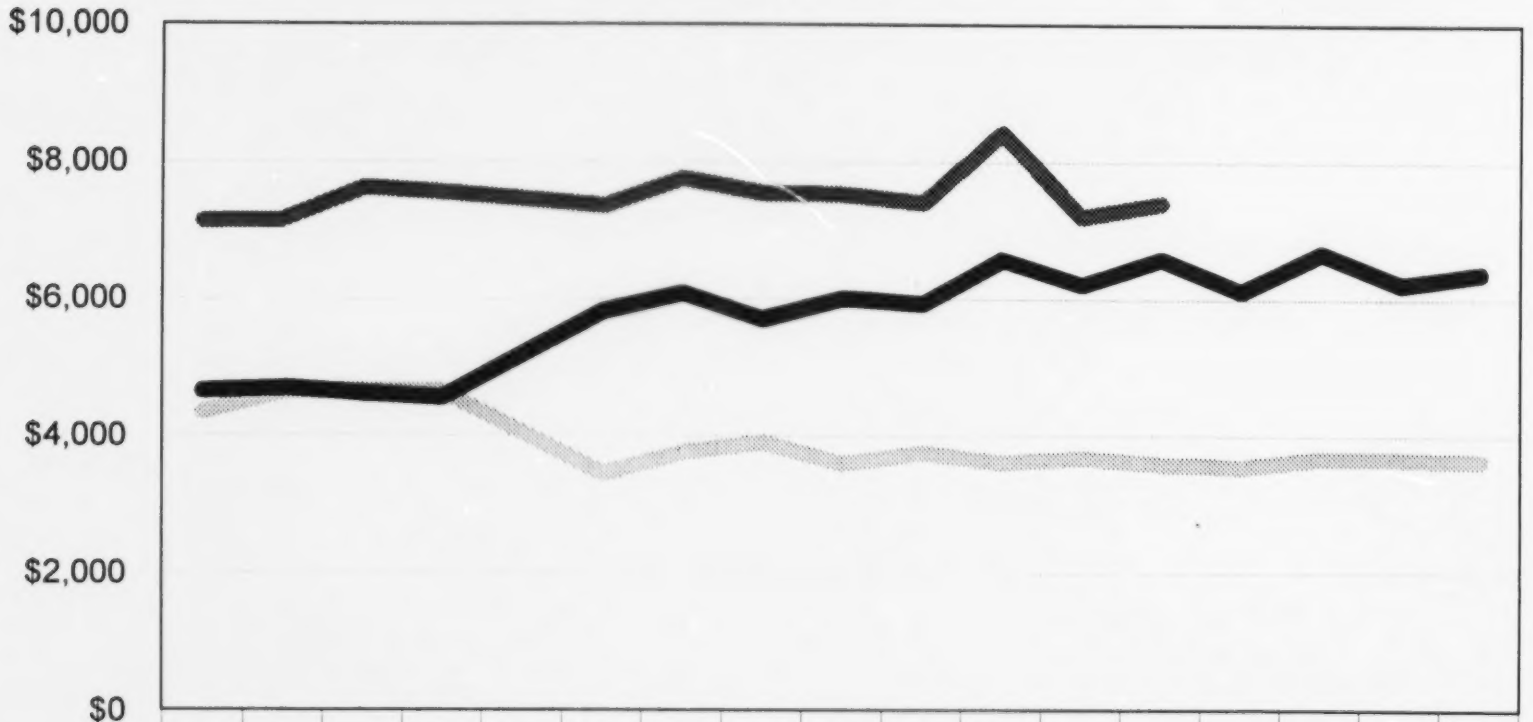
Figure 41
Quarterly Earnings Before And After Training*
1989-90 Retrainees



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8	9	10	11	12
Completers	$6,772	$7,049	$7,365	$7,446		$7,805	$7,750	$7,792	$7,747	$7,756	$7,766	$7,804	$7,756	$7,754	$7,912	$7,808	$7,761
Drops	$6,597	$6,715	$7,080	$7,112		$6,823	$6,867	$6,747	$6,847	$6,825	$7,010	$6,882	$7,010	$6,975	$7,139	$6,608	$6,697
Control Group	$7,128	$7,153	$7,617	$7,547		$7,349	$7,753	$7,542	$7,523	$7,396	$8,420	$7,194	$7,395				

* Earning for completers represent average for all completers found in the labor force that quarter. Earnings for drops assumes that drops were retained in California at the same rate as completers.

Figure 42
Quarterly Earnings Before And After Training*
1989-90 New Hire



	-4	-3	-2	-1	Train	1	2	3	4	5	6	7	8	9	10	11	12
Completers	$4,643	$4,693	$4,610	$4,549		$5,807	$6,077	$5,698	$6,006	$5,917	$6,566	$6,202	$6,579	$6,105	$6,675	$6,207	$6,377
Drops	$4,345	$4,635	$4,656	$4,649		$3,445	$3,761	$3,902	$3,594	$3,754	$3,604	$3,678	$3,589	$3,549	$3,675	$3,689	$3,634
Control Group	$7,128	$7,153	$7,617	$7,547		$7,349	$7,753	$7,542	$7,523	$7,396	$8,420	$7,194	$7,395				

Completers Drops Control Group

* Earning for completers represent average for all completers found in the labor force that quarter. Earnings for drops assumes that drops were retained in California at the same rate as completers.

1990-91 UI Payments and Weeks

Among both Retrainees and New Hires, Completers were unemployed less often and collected less in UI Payments than Dropouts, in both Year 1, Year 2 and Year 3 after training. Retrainee and New Hire Completers were consistently unemployed less than the Control group.

UI Weeks

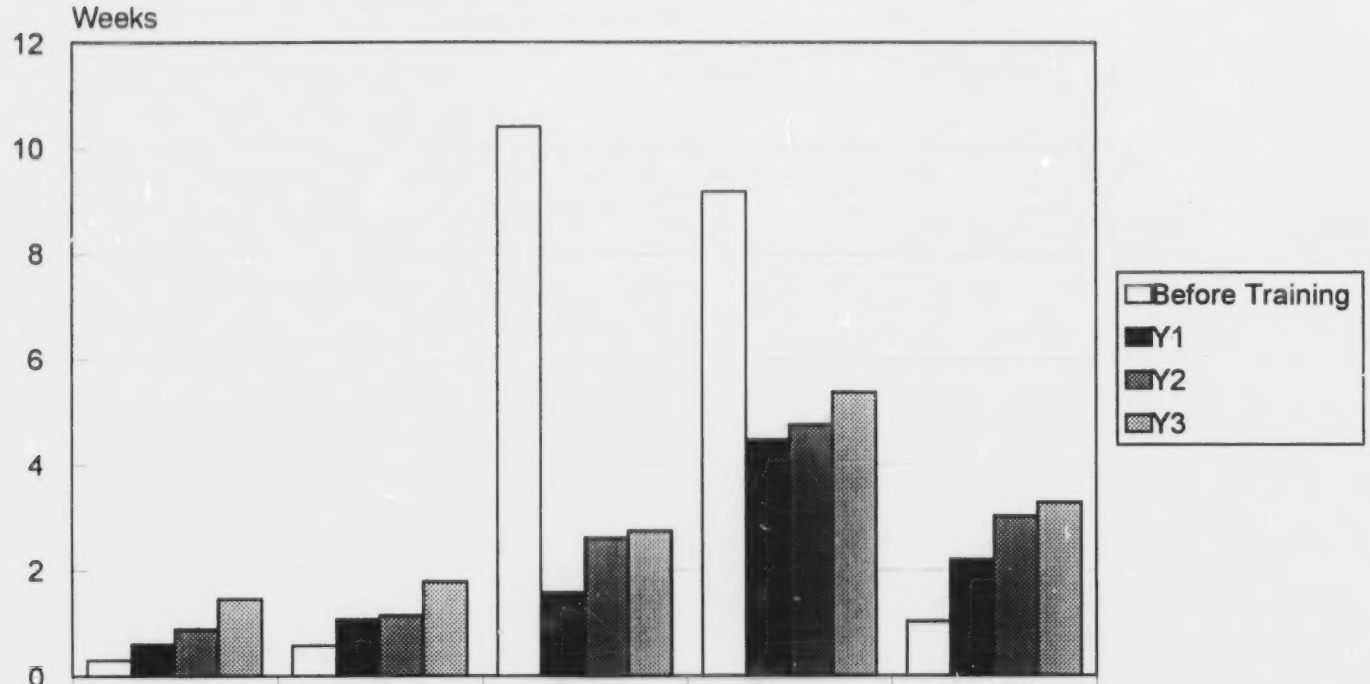
The bar chart in Figure 43 shows that Retrainees who completed were unemployed less than the typical worker in the follow-up period. Dropouts were also unemployed less than Controls in the pre-training year and, although their unemployment increased, they remained below the Controls throughout the follow-up period. Retrainees who completed were unemployed an average of less than half a week in the year before training, compared to .57 weeks for the Dropouts and 1.02 weeks for the Controls. This rose to an average of .6 weeks for Completers in the year after training, 1.07 weeks for Dropouts and 2.19 weeks for Controls. By Year 3 after training Completers were unemployed an average of 1.45 weeks, compared to 1.78 for Dropouts and 3.28 weeks for Controls.

New Hires who completed dramatically decreased their unemployment from the high levels they experienced before training, while Dropouts a smaller but still substantial decline. The New Hires who completed averaged 10.41 weeks of unemployment in the year before training, and after training the average fell by over 80% to 1.57 weeks. Unemployment rose slightly in Year 2 to 2.61 weeks and in Year 3 to 2.74 weeks. This increase was probably due to the continuing recession in California during this period. New Hires who dropped out also had a substantial decline from 9.18 weeks before training to 4.46 weeks after training, there was essentially no change in Year 2 and then a small increase to 4.75 weeks in Year 3. It is important to note that New Hire Dropouts were still unemployed far more that either the Completers or the Controls.

Figures 44 and 45 show the pattern of unemployment quarter by quarter for all four groups. The trend for Retrainees indicates that prior to training Completers were unemployed less than either Controls or Dropouts. Dropouts were very similar to the Controls. After training Completers remained unemployed less than the other two groups, while unemployment rose more steeply for Controls than for either Dropouts or Completers. Beginning at the end of Year 2 the experience of Completers and Dropouts began to converge, but Completers remained unemployed less.

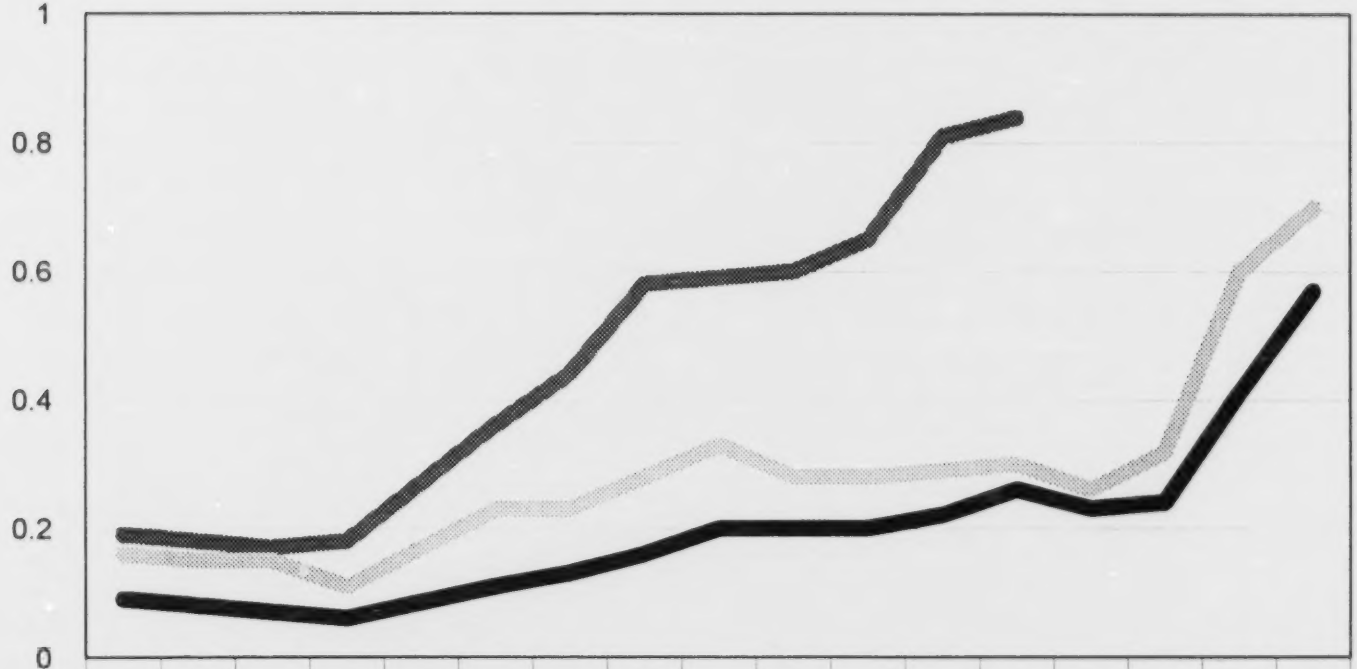
For New Hires the pattern is different. New Hire Completers and Dropouts were both unemployed far more than the Controls prior to training. After training Completers and Dropouts both immediately experience a steep drop in unemployment. Completers fell to the Control group average and then track the Control group for the remainder of the

Figure 43
Average Annual Weeks of Unemployment
New Hires and Retrainees 1989-90



	Retrain Comp.	Retrain Drop	New Hire Comp.	New Hire Drop	Control Group
Before Training	0.3	0.57	10.41	9.18	1.02
Y1	0.6	1.07	1.57	4.46	2.19
Y2	0.88	1.15	2.61	4.75	3.01
Y3	1.45	1.78	2.74	5.37	3.28

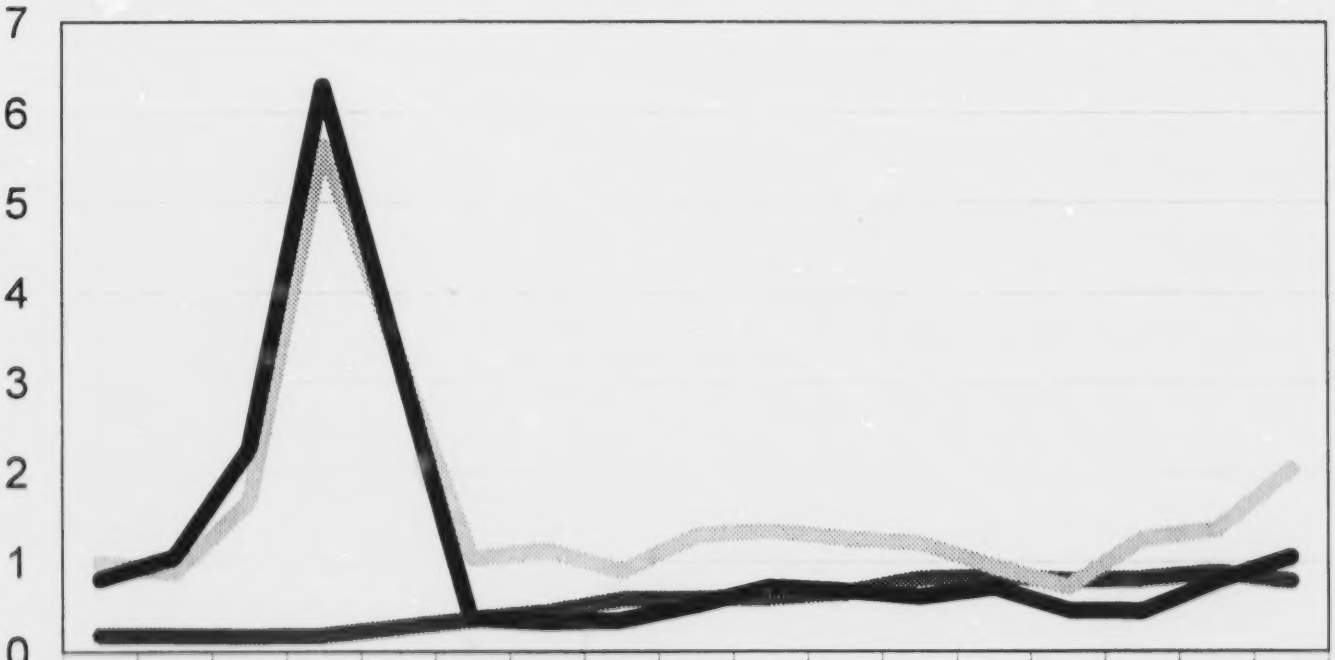
Figure 44
Average UI Weeks By Quarter
1989-90 Retrainee



	-4	-3	-2	-1	Train.	1	2	3	4	5	6	7	8	9	10	11	12
Completers	0.09	0.08	0.07	0.06		0.11	0.13	0.16	0.2	0.2	0.2	0.22	0.26	0.23	0.24	0.41	0.57
Drops	0.16	0.15	0.15	0.11	.	0.23	0.23	0.28	0.33	0.28	0.28	0.29	0.3	0.26	0.32	0.6	0.7
Control Group	0.19	0.18	0.17	0.18	.	0.36	0.44	0.58	0.59	0.6	0.65	0.81	0.84				

Completers Drops Control Group

Figure 45
Average UI Weeks By Quarter
1989-90 New Hire



	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8	9	10	11	12
Completers	0.81	1.05	2.26	6.29	.	0.37	0.33	0.35	0.52	0.72	0.67	0.61	0.71	0.46	0.45	0.78	1.05
Drops	0.99	0.87	1.69	5.63	.	1.04	1.13	0.9	1.3	1.34	1.26	1.21	0.94	0.72	1.25	1.36	2.04
Control Group	0.19	0.18	0.17	0.18	.	0.36	0.44	0.58	0.59	0.6	0.65	0.81	0.84	0.79	0.81	0.88	0.78

follow-up period. Dropouts also had a steep decline in unemployment but they remained unemployed more than either Completers or Controls for the follow-up period, with the exception of one quarter when they dipped below the Control group.

The average UI payments to the four groups largely reflects the differing patterns of pre- and post-year unemployment experienced by these groups and is illustrated in Figure 46. The 1989-90 Retrainee Completers had low average UI payments, $44 in the year prior to training, which rose to $95 in Year 1, to $142 in Year 2, and to $240 in Year 3. Retrainee Dropouts had a much more dramatic increase from $84 in the year before training to $163 in Year 1, $179 in Year 2 and $288 in Year 3 after training. Controls had their UI payments increase from $115 in the year before training to $225 in Year 1, $382 Year 2 and then $433 in Year 3.

The pattern was different for New Hires. New Hire Completers' average UI payment fell by about 85% from $1,482 before training to only $223 in Year 1, and then increased to $383 in Year 2, and increased again to $427 in Year 3 after training. New Hire Drops had a high payments before training also, $1,490, which then declined 47% to $495 in Year 1, rose again to $625 in Year 2, and reached $758 in Year 3.

The quarter-by-quarter comparison of UI payments made to Retrainee Dropouts and Completers and New Hire Dropouts and Completers tracks the earlier pattern identified for weeks of unemployment. These results are presented in Figures 47 and 48.

Multiple Employers

Data collected this year allowed us to identify workers who had more than one employer in any particular quarter. Workers may report more than one employer if they changed jobs during the quarter or if they are simultaneously employed by more than one employer. The data presented here simply show the average number of employers reported each quarter for those who reported any earnings.

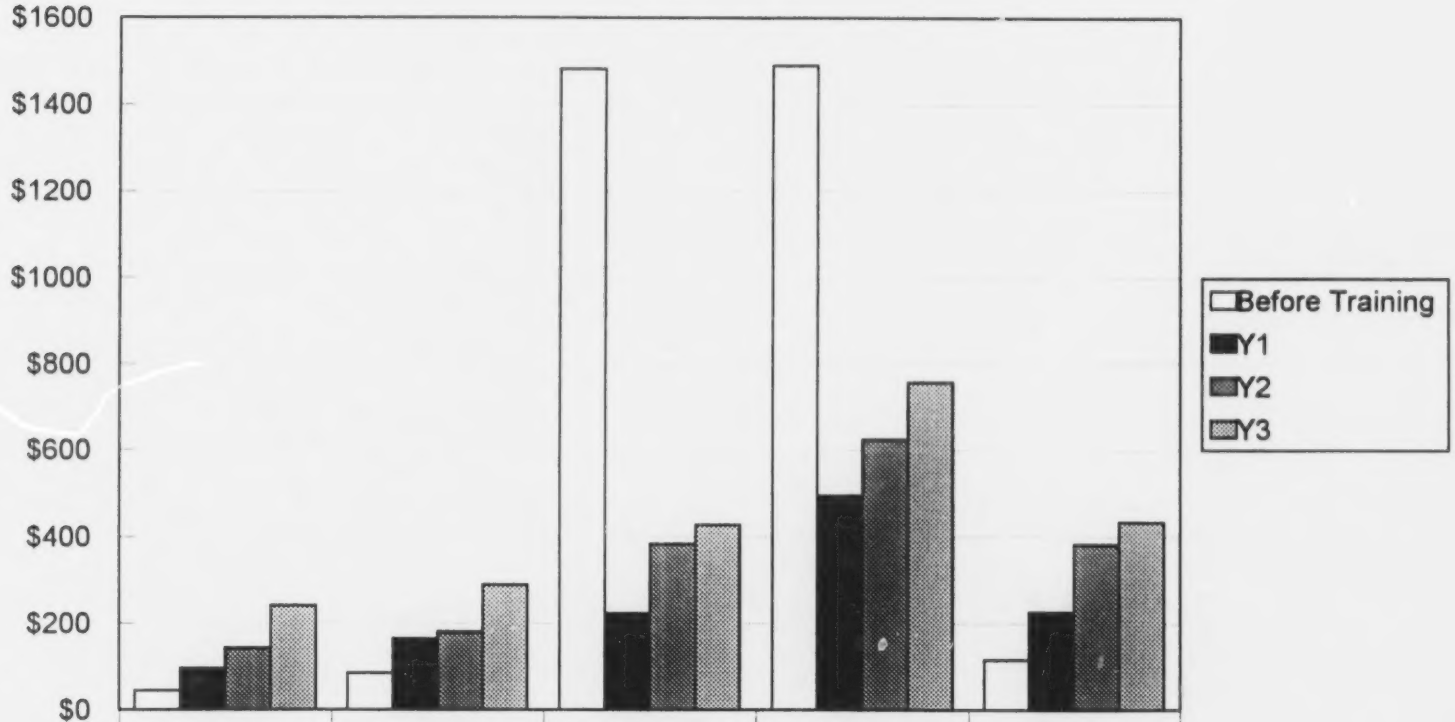
The interpretation of what changes in the average number of employers means is difficult. In general a higher average number of employers may indicate less employment stability. An increase in the average number of jobs may indicate that workers are changing jobs more often or have lost their primary job and are patching together several part-time jobs to make ends meet. It may indicate that workers have had their hours reduced at their regular job and have added a part-time job to make up for lost hours. A final interpretation is that a fully employed worker is moonlighting to make extra money.

Figure 49 shows that the average number of employers per quarter for the Controls varied between 1.11 and 1.16. If we assume that most people with more than one employer only have two (which is usually the case), we could interpret these number to

indicate that between 11% and 16% of workers had multiple employers. The Retrainee Completers tracked the Controls in the period before training, then experienced a slight bulge upward in the few quarters after training, and finally settled into a level slightly below the Controls in the middle of the second year out, where they remained. On the other hand, the Retrainee Drops, who spent the before-training period somewhat above the Completers, shot up, peaked in the third quarter after training, then declined steadily. They achieved about the same number of employers per quarter as the Control group, but they remained just above the Completers through the third year.

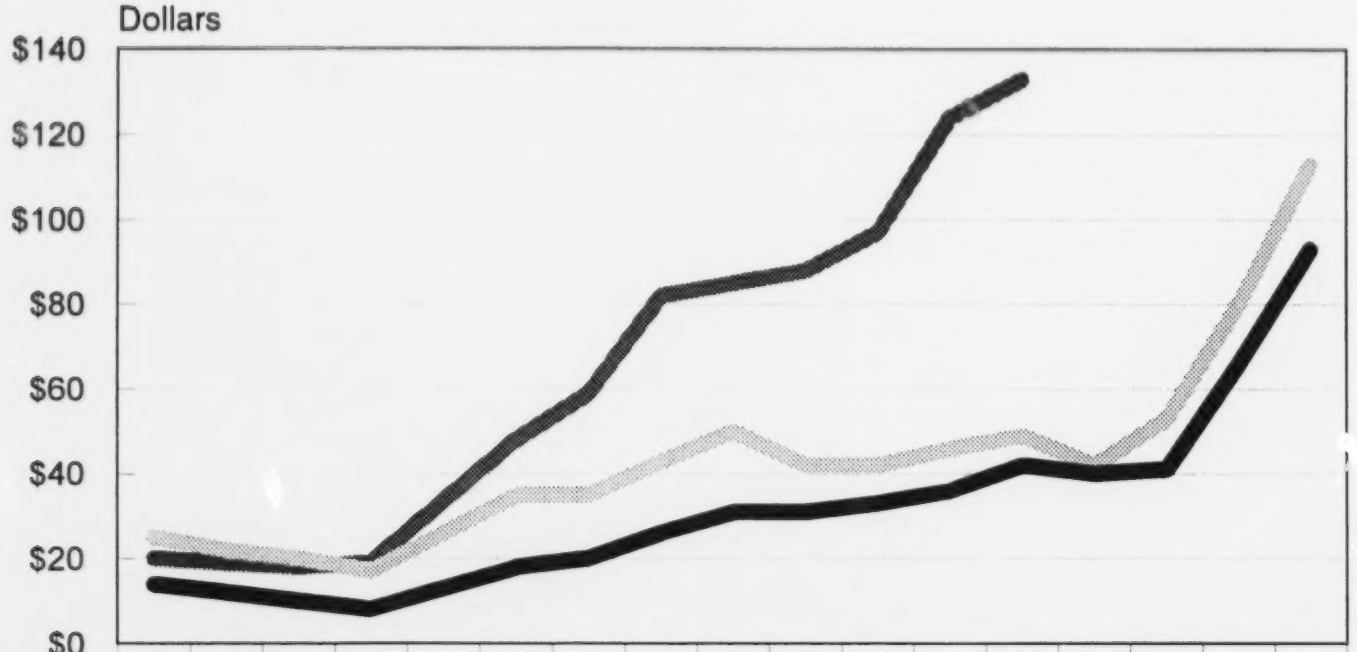
The New Hires' pattern of employers per quarter depicted in Figure 50 followed that of the Retrainees except the levels were higher for both New Hire groups in the pre-training period, and dramatically higher for the New Hire Dropouts immediately after training. The New Hire Completers' employers per quarter stayed just slightly higher than the Control group in the year after training, also reflecting the slight bulge in the third and fourth quarters of the year that were noted with the Retrainee Completers. In the second and third year out the New Hire Completers' employers per quarter joined the level of the Controls and remained at or below that level. The dramatic increase in employers per quarter for the New Hire Dropouts peaked in the third quarter after training at 1.74, then dropped over the next year to a level of about 1.2, where it remained during the third year after training.

Figure 46
Average Annual Unemployment Insurance Payments
New Hires and Retrainees 1989-90



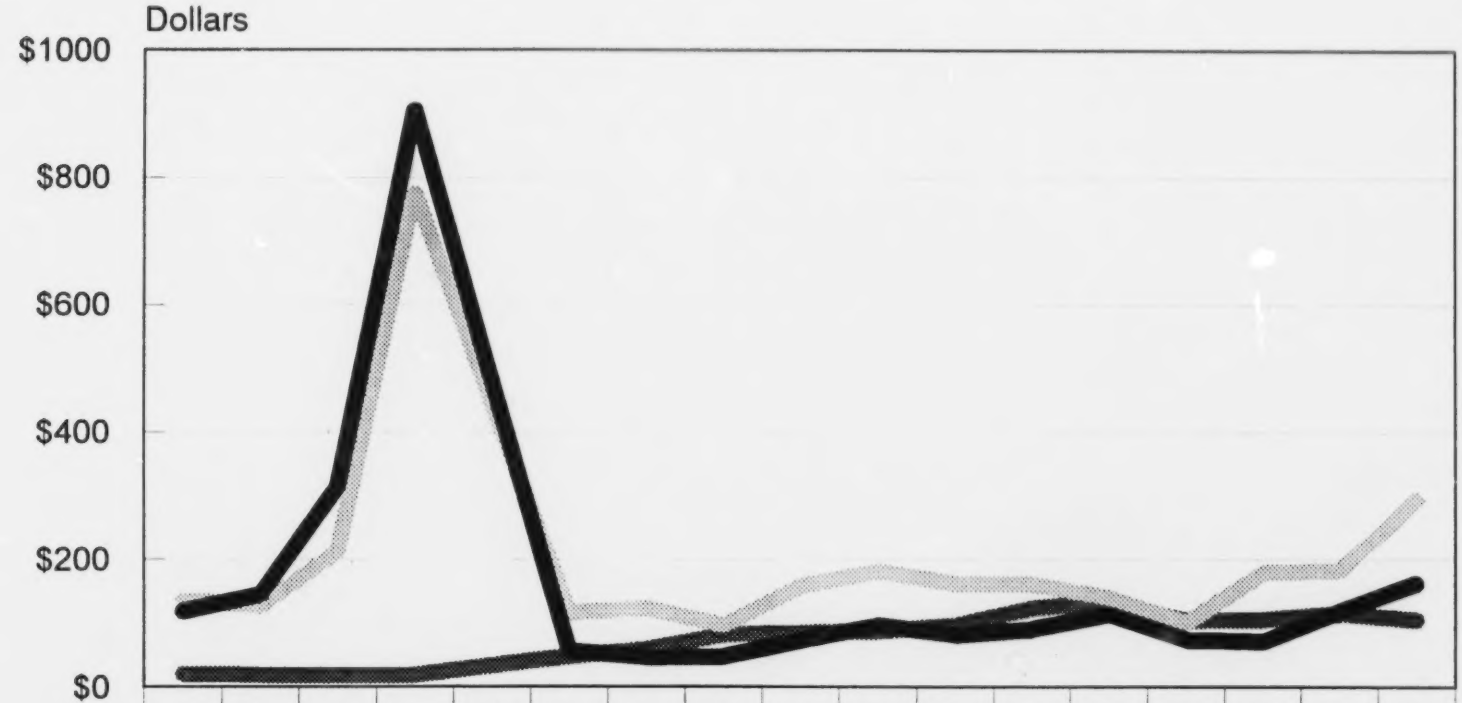
	Retrain Comp.	Retrain Drop	New Hire Comp.	New Hire Drop	Control Group
Before Training	$44	$84	$1482	$1490	$115
Y1	$95	$163	$223	$495	$225
Y2	$142	$179	$383	$625	$382
Y3	$240	$288	$427	$758	$433

Figure 47
Average Quarterly UI Payments Before And After Training
1989-90 Retrainees



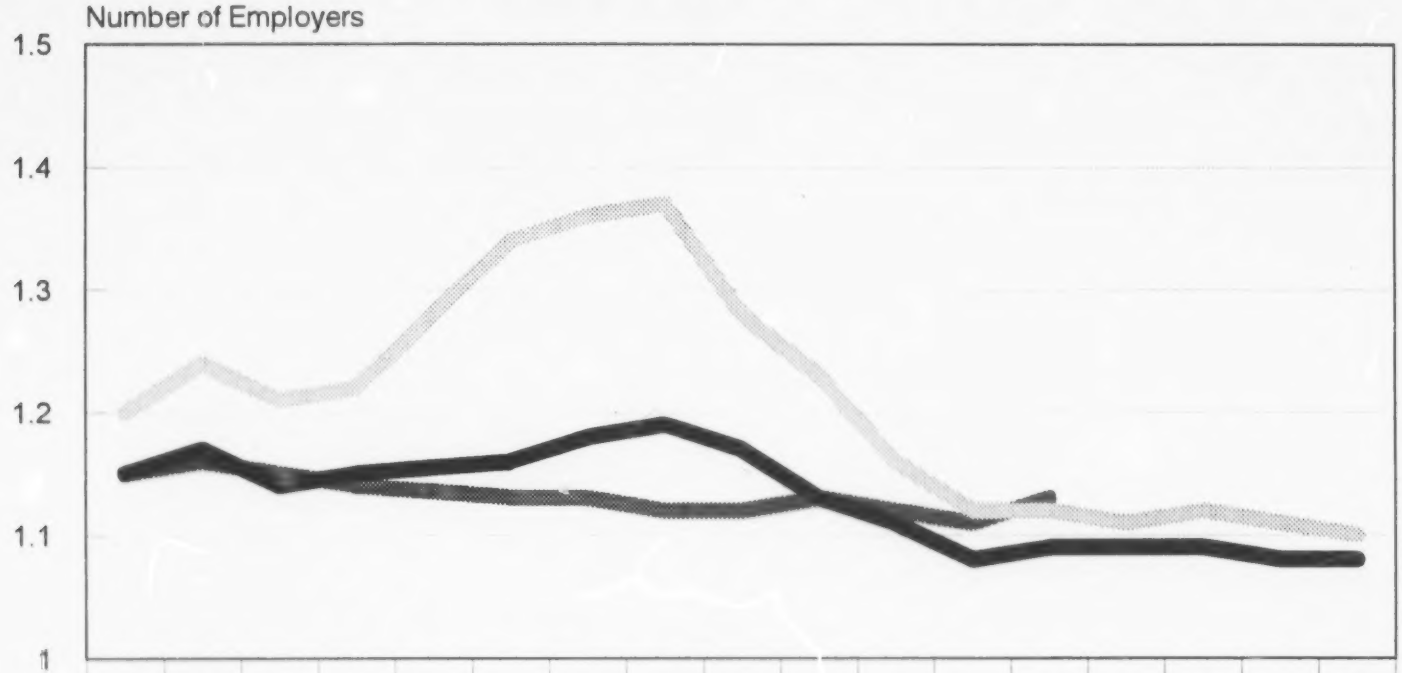
	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8	9	10	11	12
Completers	$14	$12	$10	$8	.	$18	$20	$26	$31	$31	$33	$36	$42	$40	$41	$66	$93
Drops	$25	$22	$20	$17		$35	$35	$43	$50	$42	$42	$46	$49	$42	$53	$80	$113
Control Group	$20	$19	$18	$19		$48	$59	$82	$85	$88	$97	$124	$133				

Figure 48
Average UI Payments Received Before And After Training
1989-90 New Hires



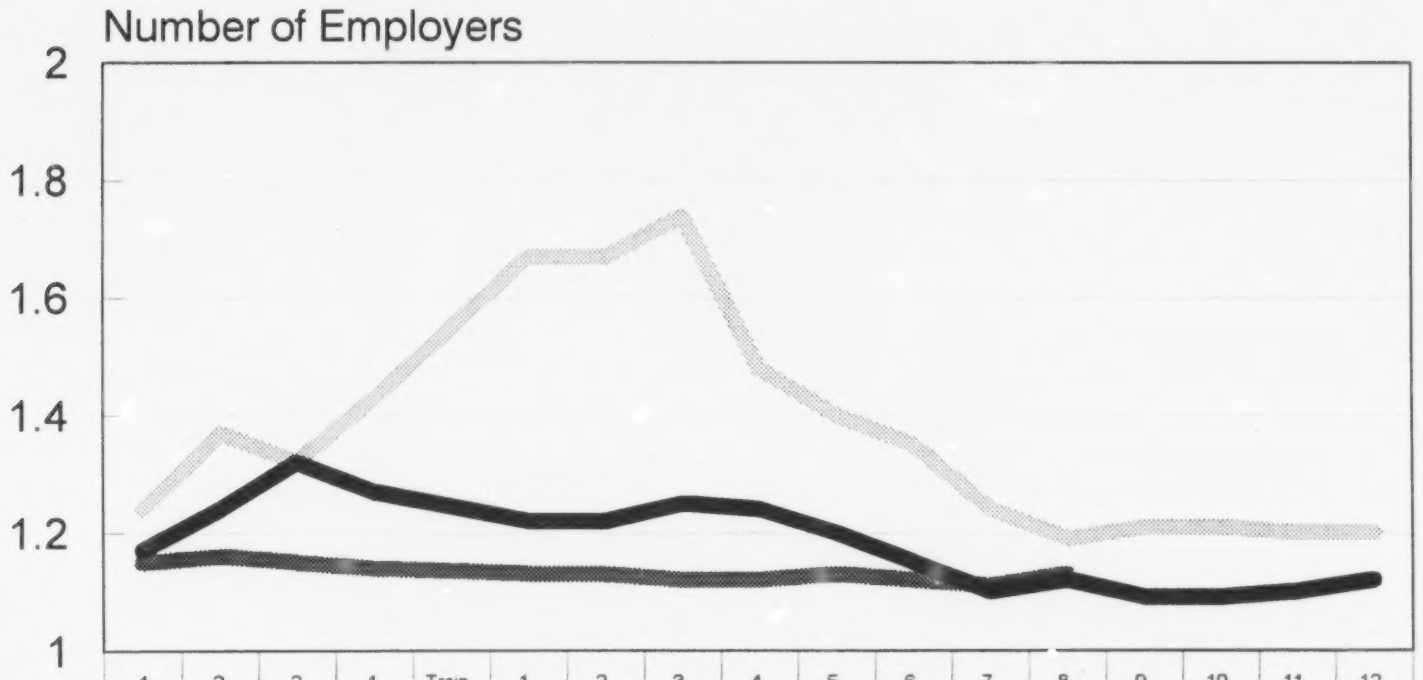
	-4	-3	-2	-1	Training	1	2	3	4	5	6	7	8	9	10	11	12
Completers	$118	$145	$314	$905		$56	$46	$48	$73	$97	$81	$91	$114	$74	$71	$119	$163
Drops	$136	$127	$212	$775		$116	$123	$97	$159	$182	$162	$161	$140	$101	$180	$183	$294
Control Group	$20	$19	$18	$19		$48	$59	$82	$85	$88	$97	$124	$133	$104	$106	$116	$105

Figure 49
Average Number of Employers By Quarter
1989-90 Retrainee



	-4	-3	-2	-1	Train	1	2	3	4	5	6	7	8	9	10	11	12
Completers	1.15	1.17	1.14	1.15	.	1.16	1.18	1.19	1.17	1.13	1.11	1.08	1.09	1.09	1.09	1.08	1.08
Drops	1.2	1.24	1.21	1.22		1.34	1.36	1.37	1.28	1.23	1.16	1.12	1.12	1.11	1.12	1.11	1.1
Control Group	1.15	1.16	1.15	1.14	.	1.13	1.13	1.12	1.12	1.13	1.12	1.11	1.13				

Figure 50
Average Number of Employers By Quarter
1989-90 New Hire



	-4	-3	-2	-1	Train	1	2	3	4	5	6	7	8	9	10	11	12
Completers	1.17	1.24	1.32	1.27		1.22	1.22	1.25	1.24	1.2	1.15	1.1	1.12	1.09	1.09	1.1	1.12
Drops	1.24	1.37	1.32	1.43		1.67	1.67	1.74	1.48	1.4	1.35	1.24	1.19	1.21	1.21	1.2	1.2
Control Group	1.15	1.16	1.15	1.14	.	1.13	1.13	1.12	1.12	1.13	1.12	1.11	1.13				

Completers Drops Control Group

Conclusions and Discussion

1. Increased employment stability is a major benefit of ETP training.

The analysis presented here shows convincingly that workers who complete ETP training are more likely to remain in the California labor market than either trainees who drop out or randomly selected workers from the same industry. ETP training probably enhances stability in two ways. First, it gives workers skills that have value in the labor market, making trainees more likely to remain employed. Second, training probably contributes to the success of companies which have ETP projects, thus making them more stable employers. More successful companies will be better able to retain workers and reward them with higher pay over time.

It also appears that the incidence of multiple employers is reduced after training for Completers, indicating that Completers change jobs less often and are less likely to have to moonlight to make ends meet or patch together two part-time jobs to earn a living.

2. ETP Trainees who complete have larger earnings increases than Dropouts or similar workers.

ETP trainees who complete earn more after training than similar workers who drop out of training or randomly selected workers from similar industries. We have estimated the impact of training different ways: making comparisons of Completers pre-training and post-training earning, comparing Completers to Dropouts, or comparing Completers to the Control group. We also used a regression model to estimate the impact of training independent of other factors. No matter how we made the comparison, both Retrainee and New Hire Completers ended up with larger earning gains.

The question this study could not answer is why the size of these earnings gains for 1991-92 trainees was less than that experienced by trainees from other years. We suspect the differences could be due to the characteristics of the companies in which workers were trained. Certainly we found the industry mix had varied substantially over the three years studied. It may also be that larger, macro economic trends have affected the size of the earnings increase. Further research into the factors that affect the impact of ETP training at project level would be valuable in helping the Panel target funds to projects where they are likely to yield the greatest return to the individual trainees and the state as a whole.

3. ETP training continues to have an positive and impressive impact on the California economy.

We estimated the economic impact of ETP training for the most recent cohort of trainees in the year immediately after training and, as we found in earlier studies (Moore, Blake and Phillips, 1994), training had an impact that far exceeded its cost. We estimated the total impact of 1991-92 trainees to be over $202 million in the just first year after training, while training cost the state only about $35 million.

From a long-term, cost-benefit perspective, ETP training also produces impressive results. We estimated that the ETP training provided to the 1991-92 cohorts would yield a $234.7 million in productivity gains alone for employed California workers over the following 12 years. This impressive productivity gain was obtained at a cost of about $35 million in UI-generated funds plus the additional costs of training that were borne by the firms and the trainees themselves. While this study does not attempt to estimate those additional costs, reasonable estimates would probably place these cost below the $35 million outlay in UI funds. Even if the additional costs were twice the $35 million outlay, the training would be a terrific deal for California and its labor force. ETP programs would be an investment in training that returned around $2.50 in present value terms for every dollar invested by everyone involved (and this return grows to $3.50 for every $1 invested if multiplier effects are taken into account)

4. During the three years studied ETP seemed to shift its emphasis away from non-basic service industries towards greater investment in basic industries.

As we and other researchers have noted, for ETP to maximize its impact on the California's economy, it should invest as much as possible in basic industries. Basic industries are businesses which either export their goods and services out-of-state or replace goods and services which are currently imported into the state. Our analysis of the industrial distribution of the trainees show a shift away from traditionally non-basic industries toward traditionally basic industries over the three years studied. For example, in 1989-90 almost a quarter of ETP trainees were working in jobs in the retail industry--a non-basic industry-- when they completed training. In the same year less than ten percent ended up working in electrical manufacturing, which includes many critical high-tech industries, which are basic. Three years later, in 1991-92, less than ten percent of trainees were working in retail and over fifteen percent in electrical manufacturing.

ETP should continue to target its investment on basic industries where increases in productivity will benefit the economy the most.

5. This study illustrates that Unemployment Insurance databases are powerful tools for measuring the outcomes of training.

These results convince us that Unemployment Insurance wage databases and claims databases provide a valuable method for tracking the experience of trainees for extended periods of time after training. We were able to track trainees for three years. In addition, the data from these sources can be used to generate a variety of measures that look at different aspects of the employment experience. Earnings measures can be used to track trends in earning annually or by the quarter. In combination with other data about the trainees, they can identify characteristics of trainees who earn more or less. Employer Standard Industry Classification (SIC) codes allow researchers to look at industry trends, or to track the movement of trainees from one industry to another. Data on unemployment insurance claims provide various measures of employment stability, as well as the length of unemployment and the cost of unemployment to the state, and of course the impact of training on employment. Finally, we discovered that by tracking the number of earning reports each quarter, we created measures of multiple jobbing which in turn created an additional measure of employment stability.

Perhaps most importantly, this study illustrates how these databases can be used to create a control group against which the experience of trainees can be measured. A major problem in the evaluation of job training programs is estimating what would have happened to trainees if they had not been trained. Creating a control group of workers from similar industries goes a long way toward answering this critical question.

While this study offers one example of how these data can be put to work, much remains to be done. Our study tracks the success of individuals, but first-hand experience with ETP projects shows that some projects are far more effective than others. These data could be analyzed further to examine the characteristics of individual projects and how they affect the outcomes of training. For example, do projects with more hours of training yield a larger impact on training: Does training in different skill areas have different impacts? Does training entire work groups yield larger impacts than training selected individuals? More analysis would create a better understanding of how training affects employment stability. Do workers who complete training stay within the same industry longer than other workers? Do workers who receive training remain with the same employer longer than other workers?

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Appendix A:
Trainee Characteristics

Comparison of Retrainees and New Hires

The typical ETP trainee was a Retrainee who completed his program. Demographically, this Retrainee was a 38 year-old, married, white, male who had completed high school and perhaps some college. See Table A-1 for a complete breakdown of Trainee demographics.

Overall Retrainees were older and more advantaged than New Hires. A comparison of Retrainees and New Hires, with the available data, reveals a number of differences between the two groups. Retrainees, the far larger group, were more likely than New Hires to be female, married, older, and white. They were also more likely to be veterans and to have more education than New Hires. Conversely, New Hires were more likely to be single, Hispanic, and male. They were also slightly younger and had less education than Retrainees. See Table A-1 for a complete comparison.

There were also differences in the characteristics of training programs that served New Hires and Retrainees. Retrainees were far more likely to be trained in manufacturing, finance or retail industries, while New Hires were more likely to be trained in a service industry. Retrainees were most likely to be trained by a large employer with over 251 employees, while New Hires were usually trained by a training agency or group of employers.

Table A-1
Comparison of Retrainees and New Hires 1991-92
(Sample Trainees n=(21,121)

	Percent Retrainees (N=18,118)	Percent New Hires (N=2,919)	Chi Sq. or T-Test Statistic (Significance)
Gender			85.9
Male	59.3	67.3	(.000)
Female	39.7	31.2	
Missing	1.0	1.5	
Marital Status			189.4
Married	53.7	40.4	(.000)
Single	36.8	48.3	
Missing	9.5	11.3	
Ethnicity			1522.6
Asian	9.3	6.2	(.000)
Black	5.1	9.9	
Hispanic	17.7	45.8	
Indian	0.7	0.4	
White	51.9	24.6	
Other	2.1	1.7	
Missing	13.2	11.4	
Age			
Average	38.2	35.2	.269 (.788)
Years			1817.4
< H.S.	3.3	11.3	(.000)
H.S. Grad.	35.4	36.2	
Some Coll.	26.7	15.7	
Coll. Grad	12.2	3.2	
Post College	4.6	1.1	
Missing	17.8	32.5	
Veteran			18.1
Yes	13.2	10.6	(.006)

Table A-1 (Continued)
Profile of Retrainees and New Hires

	Percent Retrainees	Percent New Hires	Chi Sq. or T-Test Statistic (Significance)
GAIN			7.7
yes	0.3	0.4	(.263)
Disabled			0.6
Yes	0.5	0.5	(.997)
Minority Owned			
Yes	1.4	1.4	170.0
			(.000)
Women Owned			
Yes	1.2	0.2	170.8
			(.000)
IRCA			
Yes	<0.1	15.2	4854.2
			(.000)
Industry			3453.7
			(.000)
Manufacturing	16.0	<.1	
Construction	2.6	0	
Agriculture	3.7	3.7	
Finance	15.9	0	
Trans./Comm.	0	6.0	
Services	40.9	85.1	
Retail	16.0	0	
Food Proc.	4.9	5.2	
Contractor by Business Size (Number of Employees)			6238.2 (.000)
<51	.7	0	
51-100	1.0	0	
101-250	6.5	2.6	
251+	58.5	13.9	
Small Bus. Agency	31.0	42.2	
Other Training Agency	2.3	41.4	

Comparison of Dropouts and Completers

A comparison of Dropouts and Completers within the New Hire and Retrainee groups show significant differences between the groups.

Retrainees

Demographically, the typical Retrainee Completer was a 38 year-old, married, white, male who had completed high school and even some college. Interestingly, the results indicate that Dropouts were very similar demographically. There were several small but statistically significant differences between Retrainee Dropouts and Completers. Completers were slightly more likely to be female, married, Hispanic, or White. Completers were also more likely to have completed high school or have some college than Dropouts. In addition, only Completers were found in women-owned and minority-owned businesses.

Completers were slightly more likely to have been trained in the finance and retail industries, while Dropouts were more likely to have been trained in manufacturing or services. Completers were slightly more likely to have been trained in businesses with over 100 employees, while Dropouts were more likely to be trained by groups of employers or training agencies. Table A-2 contains the detailed information.

Table A-2
Comparison of Dropouts and Completers 1991-92
(n=18,118)
Retrainees

	Percent Completers (N=14,571)	Percent Dropouts (N=3,547)	Chi. Sq. or T - Statistic (Significance)
Gender			13.8
Male	58.8	61.5	(.003)
Female	40.2	37.6	
Missing	1.0	0.9	
Marital Status			20.0
Married	54.3	51.2	(.000)
Single	36.5	38.0	
Missing	9.2	10.8	
Ethnicity			31.9
Asian	9.1	10.2	(.000)
Black	4.9	5.7	
Hispanic	18.2	16.0	
Indian	0.6	0.8	
White	52.2	50.6	
Other	2.0	2.7	
Missing	13.0	14.0	
Age			
Average	38.2	38.1	.269
			(.788)
Years			46.0
< H.S.	3.5	2.5	(.000)
H.S. Grad.	35.6	34.6	
Some Coll.	27.3	24.3	
Coll. Grad	11.8	13.8	
Post College	4.5	4.9	
Missing	17.3	19.9	
Veteran			24.4
Yes	12.7	15.2	(.000)

Table A-2 (Continued)
Profile of Completers and Dropouts
Retrainees

	Percent Completers	Percent Dropouts	Chi Sq. or T - Statistic
GAIN			12.1
yes	0.4	0.1	(.007)
Disabled			12.7
Yes	0.5	0.7	(.005)
Minority Owned			
Yes	1.7	0.0	1280
			(.000)
Women Owned			
Yes	1.5	0.0	1280
			(.000)
IRCA			
Yes	<0.1	<0.1	9.7
			(.021)
Industry			199.1
			(.000)
Manufacturing	14.4	22.5	
Construction	2.8	1.8	
Agriculture	3.8	3.4	
Finance	16.4	13.9	
Trans./Comm.	0	0	
Services	40.2	43.5	
Retail	17.2	11.1	
Food Proc.	5.2	3.8	
Contractor by Business Size			96.1
			(.000)
(Number of Employees)			
<51	.7	1.0	
51-100	.9	1.4	
101-250	7.0	4.4	
251+	59.0	56.2	
Small Business Agency	30.5	33.2	
Other Training Agency	1.9	3.8	

New Hires

For the New Hire group, the typical Completer was a 36 year old, single, Hispanic, male who had completed high school. There are several small but statistically significant differences between New Hire Completers and Dropouts. Completers were significantly more likely to be female, married, Asian or White. Completers were also more likely to have completed high school or have some college than Dropouts. In addition, no Dropouts were found in either minority-owned businesses nor women-owned businesses.

While over 80% of all New Hires were trained in the services industry there were some small differences between Dropouts and Completers. New Hire Completers were slightly more likely to be trained in agriculture or transportation/ communication than Dropouts. New Hire Dropouts were more likely to be trained in services and food processing. About 80% of all New Hires were trained by employer groups or training agencies. New Hire Completers were more likely to be trained by large employers with over 251 employees, and groups of small employers or training agencies than Dropouts. New Hire Dropouts were more likely to be trained by "other" employer groups and training agencies. Table A-3 shows the detailed information.

Table A-3
Comparison of Dropouts and Completers 1991-92
(n=2,919)
New Hires

	Percent Completers (N=1,681)	Percent Dropouts (N=1,238)	Chi Sq. or T-Test Statistic (Significance)
Gender			57.3
Male	64.8	68.7	(.000)
Female	32.8	30.9	
Missing	2.4	0.4	
Marital Status			50.6
Married	40.5	38.7	(.000)
Single	45.7	52.8	
Missing	13.8	8.5	
Ethnicity			95.3
Asian	6.7	5.7	(.000)
Black	8.8	11.3	
Hispanic	40.3	53.2	
Indian	0.4	0.3	
White	27.7	19.4	
Other	1.8	1.5	
Missing	14.3	8.6	
Age			
Average	36.0	34.1	4.650
			(.000)
Years			145.2
< H.S.	7.6	16.8	(.000)
H.S. Grad.	39.0	31.3	
Some Coll.	17.4	13.2	
Coll. Grad	3.2	3.2	
Post College	1.1	1.2	
Missing	31.7	34.3	
Veteran			57.8
Yes	11.7	8.1	(.000)

Table A-3 (Continued)
Profile of Completers and Dropouts
New Hires

	Percent Completers	Percent Dropouts	Chi Sq. or T-Test Statistic (Significance)
GAIN			33.6
yes	0.5	0.2	(.000)
Disabled			30.8
Yes	0.5	0.7	(.000)
Minority Owned			
Yes	2.6	0.0	347.2
			(.000)
Women Owned			
Yes	0.4	0.0	345.5
			(.000)
IRCA			
Yes	8.1	25.8	200.1
Industry			199.1
			(.000)
Manufacturing	.1	0	
Construction	0	0	
Agriculture	4.5	2.9	
Finance	0	0	
Trans./Comm.	5.7	0	
Services	84.8	91.2	
Retail	0	0	
Food Proc.	4.9	5.9	
Contractor by Business Size (Number of Employees)			96.1 (.000)
<51	0	0	
51-100	0	0	
101-250	3.0	2.3	
251+	17.4	10.0	
Small Bus. Training Agency	46.2	39.4	
Other Training Agency	33.4	48.3	

Appendix B:
Multipliers

The multipliers were developed from the IMPLAN system which consists of a set of computer programs, a national model of industrial production, and a massive data base containing estimates of final demands, final payments, production, and employment for each industrial sector for every county in the United States. The IMPLAN system is based on 1985 data and can provide estimates of interindustry purchase coefficients and the implied multipliers for any set of industries (up to 528 industries) and any collection of counties in the U.S. The IMPLAN system has been developed over the last ten years by the USDA Forest Service as an aid in land and resource planning.

The multipliers reported here were developed from the IMPLAN system with the industries aggregated to the eight industries identified in the ETP programmatic records, and for the entire state of California. These multipliers are reported in TABLE B-1 for output, income, and employment multipliers. The output multipliers are ratios involving the dollar value of output; the income multipliers translate the output activity into income for California residents; and the employment multipliers translate the output into jobs through output-to-employment ratios.

We used the output multipliers in our projections of the impact of ETP on the California economy because these ratios relate changes in output in one industry to aggregate output. That is, these multipliers show how much California output will change as a result of a change in output in a given industry. Our use of the output multipliers is also consistent with our decision to use the most conservative basis for our estimates of ETP impact (using 1.9 instead of 2.0 or 2.1).

We used a simple average of the output multipliers, instead of applying the various industry multipliers to the various ETP projects, because the multipliers are sufficiently close to one another in value that the more complicated procedure would not add any additional accuracy to the economic impact projection.

TABLE B-1

Sector	TYPE OF MULTIPLIER Output	Income	Employment
Agriculture Forestry Fishing Mining	1.8980	1.8787	1.7392
Construction	1.8804	2.0465	2.1362
Durable Mfg	1.8951	2.1632	2.2153
Nondurable Mfg	1.8896	2.6499	2.7280
Transportation Utilities Communication	1.8329	1.8909	2.2754
Wholesale and Retail Trade	1.9827	1.9484	1.7914
Financial Insurance Real Estate	1.6816	1.6202	1.9953
Services	2.1026	2.0267	1.7399
Simple Average	1.9	2.0	2.1